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CHRONIC SEROUS PERIMETRITIS SIMULATING CYST OF THE OVARY AND BROAD LIGAMENT.

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I. Serous Perimetritis, Encysted Dropsy, or Perimetric Cystoma.

SEROUS perimetritis is more common than the study of text-books would lead us to believe. It is unpopular amongst operators. The successful removal of an ovarian cyst, correctly recognised beforehand, counts as a triumph of diagnosis and surgery. Series of such triumphs often get into print. But authors tend to display far more modesty about their experiences in serous perimetritis. It often subsides during prolonged rest, requiring no interesting 'cœliotomy.' Not rarely is it mistaken for an ovarian cyst, a very natural error. Then an 'ovariotomy' is commenced, but no ovarian tumour appears under the abdominal wound, nothing but fluid amidst coils of intestine usually covered with inflammatory deposit resembling a cyst wall. So the operation is not an ovariotomy, and certainly bears a flavour of defeat rather than victory about it. Why, then, reckon it amongst ovariotomies? Sometimes the surgeon is in doubt, or even correctly diagnoses serous perimetritis. He makes an exploratory incision, and detects that morbid condition. Yet, even if an honest man of science, the keen operator is too apt to look on such a case as 'only' an exploratory operation. As a matter of science and

medical ethics an experience of this kind should always be recorded. This communication will therefore be devoted to my own experiences in the surgical treatment, interesting though inglorious, of an important and not very rare sequel of pelvic inflammation. I shall relate three operations for what Mr. Targett would term 'perimetric cystoma.'*

I need not describe at length the pathology of serous perimetritis or encysted dropsy in the female, nor dwell on subtle questions such as the difference between encysted inflammatory serum and encysted hydroperitoneum of non-inflammatory origin. Matthews Duncan, the master of a large school of living teachers, did not clearly distinguish between these conditions. He writes† that he and his pupils had observed in St. Bartholomew's Hospital 'several cases of peri- and parametritis with hydroperitoneal collection; and you know that there is a disease called serous perimetritis, which may be described as perhaps only an *extreme condition of the same*, where the fluid is contained in a cyst formed by peritoneal adhesions and viscera. Chronic peritonitis and tubercular peritonitis have, as one of their great peculiarities, *hydroperitoneal collection*.' The latter term, however, is meant by other writers to imply the absence of any previous or present inflammation. I shall relate a case which would seem to come under this category.

Hubert Roberts,‡ in discussing the pathology of serous perimetritis, remarks that 'large effusions shut up in adhesions are important because they cause great tension, pressure, and displacement of the parts either in the pelvis or above it. The swelling itself may cause great difficulty in diagnosis, but such cases are *preceded by inflammation*. They are fixed, and often surrounded by adherent bowel. . . . The false capsule surrounding such an effusion is often very thick, *and may even resemble a cyst wall till its relations are demonstrated by operation or dissection*. Effusions of this nature have been mistaken for ovarian cysts, intraperitoneal abscess, and hæmatocele.'

The history of inflammation is of high importance, but not always clear, and women with ovarian cysts may have had inflammatory attacks resulting from or independent of the tumour. Roberts

* 'Perimetric Cystoma,' *Trans. Obstet. Soc.*, vol. xli., 1899, p. 343.

† 'Clinical Lectures on the Diseases of Women'; lecture on 'Hydroperitoneum.'

‡ 'Outlines of Gynæcological Pathology and Morbid Anatomy,' p. 49. See figures (Fig. 9, p. 48) representing Walter S. A. Griffith's well-known case, where the collection of serous fluid lay anterior to the uterus. In Targett's and the three described in this article the fluid lay posterior. I know of no preparation showing the latter condition in section.

rightly dwells on the false capsule. It puzzles many an experienced operator; it acquires large veins, which give it an appearance suggesting broad ligament. This peculiarity of serous perimetritis is one of the chief reasons why it is so seldom reported when an operation has been performed. The surgeon is apt to be misled, taking the capsule for a true cyst wall, and should he have diagnosed serous perimetritis correctly before opening the abdomen, he may wrongly think that he was in error, and look upon his operation as a miserable, incomplete affair where a cystic tumour could not be removed entire.

I have given elsewhere* reasons for suspecting that some of the cases diagnosed by Lawson Tait as 'cyst of the urachus' were simply encysted dropsies of the serous perimetritis type. That authority seemed to be deceived by parietal peritoneum altered by inflammation (usually tubercular) so as to look like a cyst wall lying anterior to the peritoneal cavity. The layer of false membrane lining the intestines, constituting the posterior wall of the cyst, was taken for the parietal peritoneum.

Martin, in one of the most exhaustive treatises on diseases of the ovary ever written,† admits that very great difficulty in diagnosis is caused by this condition, or by any kind of encysted ascites. He correctly notes that the contour of a collection of fluid of this kind is usually far less defined than is the circumference of a true cyst. When this is the case, diagnosis is not difficult, but a true cyst not very tense and adherent to bowel may feel very ill-defined at its periphery.

Lastly, Targett (*loc. cit.*), as observed above, elevates serous perimetritis to brevet-rank as a tumour, proposing to bestow on it the name 'perimetric cystoma.' He cites, as an example, a case very like my own presently to be related. Double salpingitis existed. 'On clinical examination there was a large tumour in the pelvis, which extended upwards into the abdomen halfway to the umbilicus on the left side. At the operation it was found that the greater part of this tumour consisted of a multilocular cystoma formed between adhesions in connection with the left uterine appendages, and filled with clear serous fluid. Beneath it was the thickened and distended left tube containing pus. The boundaries of this cystoma were as follows: In front of it was the stretched mesosalpinx and broad ligament of the left side; below and on the outer side were the left

* 'A Case of Cyst of the Urachus, with Notes on Urachal and so-called "Allantoic Cysts,"' *Med. Chir. Trans.*, vol. lxxxi., 1898, p. 301.

† 'Die Krankheiten der Eierstöcke und Nebeneierstöcke,' 1899, p. 745.

ovary and distended tube; above it was the uterine end of the left tube and adherent omentum; whilst posteriorly it was bounded by the adherent sigmoid flexure. A large space was thus formed, which was subdivided by membranous adhesions into loculi, and the whole space was filled with 8 or 10 ounces of serous fluid.'

II. Encysted Tuberculous Perimetritis to be excluded.

I have purposely excluded all cases of the encysted type of tubercular peritonitis. In none of the three cases of serous perimetritis to be described was there any history or evidence of tubercle. The fact that there was encysted ascites was the sole element of suspicion. On the other hand, in ten cases where I recently made exploratory incisions for tubercular peritonitis, I found, as I expected, the dry type of that disease in four, and in two I let out a few ounces of serum, though there was little or no dulness on percussion. On the other hand, in four I found several pints of free fluid in the peritoneal cavity, whilst all four cases showed evident signs of tubercle before the operation.

I cannot dwell on so important a subject as tubercular disease of the peritoneum. It only comes within the scope of this paper in respect to the encysted dropsy which constitutes the main feature of one of its varieties. The above observations refer to cases as purely peritoneal as possible, no examples of distinct tubercular pyosalpinx, or any other apparently primary tuberculous disease of the upper genital tract, being included.

Still, this communication is based on what is, surgically speaking, exploratory operation for ascertaining the nature, seldom thoroughly clear, of an ill-circumscribed collection of fluid in the lower part of the abdomen. The operator must not be surprised if he finds not only fluid, but also flakes and much disease of the parietal and visceral peritoneum under such circumstances. The pelvic viscera will almost certainly be involved as well. When these evidences of tubercle are discovered, neither drainage nor gauze-packing should be resorted to. In reporting some recent cases of tuberculosis of the peritoneum, Christian Fenger states that 'fæcal fistula appeared in six out of the nineteen cases of tuberculosis sicca. This demonstrates how easy it is to injure the intestine in the dry form of tuberculosis in an attempt to loosen the intestines to reach the semifluid exudate, and also how easily gauze-drainage may aid the tuberculosis in perforating into the bowel, with a resultant fæcal fistula.'* These

* 'Treatment of Tuberculosis of the Peritoneum,' *Annals of Surgery*, vol. xxxiv. (December, 1901).

remarks do not only apply to the dry type. I nearly lost a case through draining eleven years ago, and I have never resorted to drainage since.* Howard Kelly has abandoned drainage for more than five years.† Flushing the peritoneal cavity with saline solution answers best when it is but little obliterated by adherent coils of intestine, which means, let the surgeon remember, that the tuberculous disease is very mild; hence good results after flushing are not assuredly due to that practice. When a small, irregular space has been opened, containing but a pint or two of fluid, and bounded by adherent coils of diseased gut, which means advanced disease, that cavity should be dried with sponges or sterilized gauze. Kelly insists on the removal of all fluid.‡ The peritoneum should be closed separately with fine silk; in any case, at least, deep sutures passing through the surface of the skin should never include the diseased serous membrane, else the tubercular process may track along a suture up to the integument —a grave and distressing complication. I have always taken this precaution, having known of instances of skin infection. This incision and emptying of the fluid, with the precautions just mentioned, often answers well, though the prognosis is always doubtful; nor can the operator ever feel sure that any subsequent tuberculous manifestation may or may not be due to the operation. Thus, in the four cases where I emptied out a large quantity of encysted fluid, the ascites did not recur; but in one of them the patient was tapped for pleural effusion one year afterwards. I must repeat that the fact that there is plenty of fluid implies—in many cases, at least—that the disease is mild, and must further express my opinion that some writers tend to assume that a distinct encysted dropsy in a woman—a marked case of serous perimetritis, in fact—is probably of tuberculous origin. Hence many cases registered as tuberculous perimetritis or tuberculous serous peritonitis, cured by incision and emptying of the fluid contents, were either mild, tending naturally to cure, or were not tuberculous at all. Indeed, precise observers are becoming more and more doubtful about surgical interference in any form of tuberculous peritonitis, even in the serous type still held to be so amenable to active treatment. Fenger (*loc. cit.*) quotes words from a recent monograph by Borchgrevink: 'Serous tuberculous peritonitis is a territory which surgery must hand back to the internal medicine clinic, with thanks for the splendid opportunity which a misunder-

* The case is related in a paper, 'Cases of Tuberculous Disease of the Uterine Appendages and Peritoneum' (*British Medical Journal*, vol. ii., 1893, p. 147).

† 'Operative Gynæcology,' vol. ii., p. 147.

‡ *Ibid.*, p. 145.

standing gave to the profession, by means of laparotomy, to study tuberculosis in one of the large cavities of the body.'*

I will now turn to non-tuberculous serous perimetritis—a far more satisfactory subject; for, though neither active nor expectant treatment always gives good results, there is at the worst no grave constitutional malady in the background. Three very typical cases under my own care will be first described:

III. Three Cases of Serous Perimetritis.

CASE 1.—*Fluctuating hypogastric swelling in sterile young married woman, mistaken by patient for pregnancy—No history of pelvic inflammation—Incision—Encysted collection of serous fluid—Position of ovary very clear—Cavity packed with gauze—Subsequent drainage.*

L. S., twenty-nine, married two years, was sent to me on June 9, 1899, by the late Dr. McLaurin, of Brondesbury, on account of an abdominal swelling. She had never been pregnant, and the period after, as before, marriage was perfectly regular and scanty. The abdomen often became distended when she was single. Over seven months before I examined her she noticed a distinct swelling in the hypogastric and umbilical regions, and fancied that she felt fœtal movements.

The patient was fairly well nourished. The breasts were small and the nipples dark, with no areolæ; the complexion was quite dark. I found the abdomen greatly distended to above the umbilicus by a somewhat flaccid, fluctuating tumour. There was resonance in the flanks and epigastrium. The cervix lay high up; it was small, and the sound could only be passed for 1 inch. The fluctuating tumour pressed down into Douglas's pouch.

The temperature was normal; the pulse 84, small, regular; the urine medium yellow, clear, specific gravity 1022, no albumen; the tongue was clean; and the bowels acted naturally. There was no history of pain or fever, recent or otherwise, or of any illness before or after marriage.

On June 15, 1899, I operated. On opening the parietes, a very thin-walled cyst with a yet thinner capsule was exposed. On tapping it, 7 pints of a yellow fluid containing cholesterine came away. The capsule involved the sigmoid flexure, and the right ostium appeared to open out on it as in a common parovarian cyst, though in reality the ostium opened inwardly, not externally. The capsule ran on to the bladder anteriorly, and was continuous with the serous coat of the uterus internally, but the uterus was not very easy to define. On peeling off the cyst-wall from the capsule, to my surprise I found the right ovary running straight across the cyst cavity anteriorly, with a very long ovarian ligament attached to the inner border of the uterus, the limits of which organ now became clear. The outer end of the ovary was attached to the wall of the pelvis.

As the patient was placed in the Trendelenburg position, the deep recesses of the pelvis could be plainly seen. The base of the cyst proved to be the peritoneum of Douglas's pouch, and the ureter and pelvic vessels showed plainly through the thin, uninflamed serous membrane. I could

* The above observations apply to tuberculous peritonitis alone, excluding a yet graver question, tuberculous disease of the tubes and ovaries and its treatment. Incomplete removal of the appendages often aggravates the disease, however thoroughly the peritoneum is dried. The pedicle is unhealthy, and a large abscess may form round the ligature.

trace it to the brim of the pelvis, where the external iliac vessels could clearly be seen through it. Over the obturator foramen was a hole in the serous membrane as big as a sixpence, showing fatty tissue. I removed the ovary, which did not seem healthy; then the cut edge of the pseudo-cyst and capsule, after some trimming, was closed with a purse-string suture, fixed to the parietal peritoneum at the lower angle of the wound, and packed with iodoform gauze.

Dr. Lockyer reported the fluid as: 'Amber coloured; specific gravity 1022; neutral, almost solid albumen on boiling, loaded with cholesterine, no sugar. The fluid coagulates at 73° C. (163° F.).'

In twenty-four hours I removed the gauze, which was soaked with a tea-coloured fluid, and inserted a rubber drainage-tube into the cavity. A few drachms of serum came out of the tube daily for about a week; then the cavity had become very narrow, and was syringed out daily with weak zinc lotion until it closed. There was no fever during convalescence.

I understand that the patient was in good health a few weeks after her discharge from hospital, when she moved, but I have been unable to hear any tidings of her since.

CASE 2.—*Fluctuating hypogastric swelling in sterile young married woman—Eight months' history of pelvic inflammation—Incision—Encysted collection of serous fluid—Position of ovary very clear—Drainage with rubber tubing—Free escape of bloody serum for ten days.*

A. A., twenty-eight, married seven years, never pregnant, was sent into my wards by Mr. Butler-Smythe on July 10, 1900. He reported that she had been growing stout for the last six weeks, a swelling being noticed by the patient as beginning distinctly on the left side of the abdomen. In November, 1899, she was seized with pain in the hypogastrium and left iliac fossa. In a month a hypogastric swelling developed. Dr. Fairland, of Elgin Avenue, treated her for pelvic inflammation, and the swelling grew smaller for a time, and then remained stationary. It seemed to Mr. Butler-Smythe that a cyst of not very evident nature occupied the lower part of the abdomen. The period was and had always been perfectly regular.

The patient was a healthy young woman, without a sign of pregnancy past or present. A swelling, which fluctuated obscurely, lay in the lower part of the abdomen, reaching nearly to the umbilicus. There was resonance on percussion over its upper part. The cervix was small, the os narrow. The sound entered 2½ inches, and its point (in the fundus) could be felt just above the pubes, in front of the lower part of the tumour, to the right of the middle line.

The temperature was normal; the pulse 84 to 90, small and regular; the urine, golden yellow, clear, specific gravity 1018, acid, no albumen; the tongue was clean and the bowels regular. Five years before observation the patient had a very severe attack of rheumatic fever, which laid her up for nearly thirty weeks; then she had an attack of pneumonia, and was in danger for some time. There was no evidence of heart complications, nor of any lesion suggesting peritonitis till the illness for which Dr. Fairland attended her.

I operated on July 17, 1900. The abdominal walls were very vascular, the tissues bleeding freely when divided, as in cases of uterine fibroid. The urachus was conspicuously stout. This suggested malformations, and I did not cut it lest it might bear an unobliterated canal communicating with the bladder. A prominent cyst bulged up against the parietal peritoneum, so thin-walled that it seemed dark. It bore big veins. The uterus seemed as though reflected on its outer wall, whilst backwards and upwards it appeared to pass on to the peritoneum above the pelvis. I tapped it, and over 2 pints of fluid, apparently ascitic, escaped. The cyst then collapsed. It had a capsule on which ran the sigmoid flexure of the

colon. I enucleated all the upper part of the cyst; the capsule, which seemed to be peritoneum, was very vascular. On opening the cyst I detected a condition which I had already observed in Case 1. The left ovary lay inside the cavity of the cyst, projecting from its anterior wall. The ovarian ligament was much elongated, and easily traceable to the left side of the uterus. The ovary tailed away externally towards the brim of the pelvis, where the ovarian vessels ran to enter that organ. I tied the vessels, and removed the ovary, which was unhealthy. The right tube and ovary were bound down with soft adhesions. (It is noteworthy that the catamenia had been perfectly regular, though the right ostium tubæ was sealed down, and the left lost on the capsule of the cyst.) Douglas's pouch was almost obliterated by adhesions. I trimmed away much of the upper part of the cyst, and, as in Case 1, made a purse-string suture close under its cut border, which I fixed to the parietal peritoneum at the lower angle of the wound. I drained the cyst cavity by means of a stout piece of red rubber tubing. I tied, as in the previous case, several vessels on the cut edge of the cyst, as the purse-string suture is not sufficient for arresting hæmorrhage. Six hours later I found that there had been considerable bleeding from a small artery in the edge of the capsule close against the purse-string suture. The vessel spouted on removing the dressings, and was secured. The patient was none the worse, but much clot came away. There was much escape of blood, and later of bloody serum, from the tube, which I could not remove for ten days. I dwell on this after-history, as it seems to show, as far as a single case can show, that gauze packing is preferable, in cases where cystic cavities are left open, to drainage by tubes.

Altogether, the cyst contained about 3 pints of fluid; over ½ pint was removed by sponges or lost after tapping. It was medium yellow, perfectly clear, specific gravity 1020, and distinctly alkaline. It almost solidified on boiling with nitric acid. The capsule seemed to be an involution of peritoneum; the tube was lost on it. Unfortunately I could not find the ostium either during the operation or at the excised part. Very possibly it opened *inwards*—that is, into the cyst cavity, as in Case 3—but all proof of this relation was lost. As the ovary was inside the cyst cavity, and in relation to its anterior wall, the cyst could not have developed between the folds of the broad ligament.

On January 12, 1902, eighteen months after the operation, the patient wrote to me saying that she was quite well, and that the periods were regular.

Case 3.—*Fluctuating hypogastric swelling, movable laterally, in a multipara—Acute perimetritis after labour, followed by ill-health for nearly two years, and ultimately by the abdominal swelling—Incision—Encysted collection of serous fluid—Position of ovary detected with difficulty—Cavity packed with gauze.*

S. A. S., thirty-six, married thirteen years, was admitted into the Samaritan Hospital on October 1, 1901, for an abdomino-pelvic swelling of uncertain nature.

When sixteen she had suffered from typhoid fever. Her six pregnancies had all given her trouble in various ways. (First birth at full time, craniotomy; second, eighth month, forceps, child lived twelve hours; third, seventh month, forceps, flooding and retained placenta, child living; fourth, eighth month, natural labour, lingering, child living; fifth, ninth month, natural, lingering, child lived five months; sixth, ninth month, child lived, mother never in good health since; no abortions.) The sixth confinement was on December 13, 1899.

On the second day after the sixth or last labour 'rigors' occurred. The patient used that term in telling me of her case, but I must note that she was highly neurotic, and when in pain on the second day after the

operation she shuddered once or twice as I was watching her, and said that the 'rigors' had come on. For a fortnight she felt well, and then pain set in referred to the abdomen and loins, with irregular uterine hæmorrhages. These symptoms continued, and at the end of seven weeks she was sent into St. Bartholomew's Hospital, under the care of Dr. Champneys. Mr. F. A. Rose, Resident Midwifery Assistant, kindly sent me the following note from the registrar's report:

Sarah Stevens was admitted into 'Martha' Ward, February 10, 1900, and left for Swanley on March 14, 1900. On admission she complained of pain in the hypogastrium and iliac fossæ, following a confinement on December 13, 1899. On examination the cervix was found somewhat to the left, and fixed to the left side of the pelvis by a dense, slightly tender induration which lay on the left side of the rectum, and was of about the size of an orange. No soft spot could be felt in it. Sound, concavity forwards, 2½ inches. The patient's general condition gradually improved, and the pain disappeared. In March, when she was discharged, Dr. Champneys again examined her, and reported: 'Uterus is tethered to left sacro-iliac joint; between it and the bone is a softish resistance, as of a distended tube. She suffered from bronchitis whilst in the hospital.'

After her discharge she suffered from occasional recurrence of the hypogastric pains, but never had to take to her bed. During the summer of 1901 the abdomen began to swell distinctly, and the late Mr. Swanson, of Enfield Lock, detected a cystic tumour of obscure nature.

The patient was well nourished, and did not look ill, but, on the other hand, was distinctly neurotic, owing, her friends said, to repeated attacks of illness. A tumour, laterally movable, obscurely fluctuating, and very tender on touch, reached to the umbilicus. It was dull on percussion and continuous with a swelling in the left fornix. The cervix was small; the sound passed 3 inches. The uterus and the tumour moved together. The period was regular, appearing every four weeks, and the show free, recently freer. It began during her stay in the hospital, on October 4, and was more abundant than before, ceasing on the 8th. The temperature never exceeded 99·2°. The pulse was 108-120; no cardiac mischief was detected, but the patient was very neurotic. The urine was clear and free from albumen. The tongue was clean and the appetite good, but the bowels were loose, and this relaxation had gone on for the last three months.

Diagnosis was very obscure, and an exploratory operation seemed indicated. The marked lateral mobility of the swelling and the distinct fluctuation, which could be felt when the patient had rested for a fortnight in bed and tenderness had subsided, suggested the presence of a cystic tumour; but the pelvic symptoms were obscure: the uterus, the tumour, and the mass in the left fornix moved together, but how far they were connected could not be made clear by touch above.

I therefore explored on October 17, 1901. A thin, pellucid membrane like a cyst wall was exposed. On tapping, 1 pint 14 ounces of a greenish-brown fluid escaped. On opening it, I saw the ostium of the right Fallopian tube with the fimbriæ well developed. This ostium clearly opened into the cavity of the 'cyst,' but not after the manner seen in the few genuine tubo-ovarian cysts described in medical literature.

I enucleated the upper part of the boundaries of this cyst-like cavity, which dipped down below beneath the level of the uterus, and was there simply peritoneum. The right half of Douglas's pouch, in fact, made up the lower part of the cyst. The left appendages lay in the left half, healthy, except for a small retention cyst on the surface of the ovary, which burst during handling.

The cavity was packed with iodoform gauze, and its upper border secured with a purse-string suture and brought down to the lower angle

of the abdominal incision. The tube was partly removed, with its ostium, in trimming away the upper part of the boundaries of the cystic cavity, and some vessels required ligature. Near the outer edge of the portion trimmed away were a thickened structure, the ovary flattened against the brim of the pelvis, and a large artery which was ligatured.

The parts removed were sent to Dr. Lockyer for examination. He found that the piece of 'cyst wall' as it appeared at first was membrane of the character usually seen in serous perimetritis—highly organized false membrane, in fact. The greenish-brown contents of the 'cyst' had all the characters of ascitic fluid, and turned solid on boiling. The greenish tint, more frequent in ovarian than in ascitic fluid, made me suspect for a few minutes, before I could make out the lower relations of the cavity which held it, that there was a true ovarian cyst.

Forty-eight hours after the operation I removed the gauze packing, as there was slight abdominal distension. Flatus had, however, passed freely already. The distension at once subsided, and the patient recovered speedily; the pulse, which had been rapid before the operation, soon fell to 90.

The patient wrote to me just three months after the operation, informing me that she was in fairly good health, though she suffered occasionally from lumbar and hypogastric pains. The drainage track had ceased to ooze, though a little fluid continued to issue from it for over two months. The period, which did not appear for some time after the operation, was seen in December, and after a normal interval in January.

Before considering these cases, some reference must be made to other cystic tumours in the same region. There are true cystomas, one type of which contains a serous fluid; and there is a sub-peritoneal cyst, without true walls, very interesting when compared with serous perimetritis.

IV. Ovarian and Parovarian Cysts.

It is needless to compare the above reports of cases of serous perimetritis with similar reports of cases of true ovarian cysts and true parovarian cysts. The relations and appearances of these common tumours are well known, and all operators are familiar with the common ovarian fluid and with parovarian fluid, which is watery, of very low specific gravity, and free from albumen. I here employ the term 'parovarian' in its sense as usually understood, as there is no necessity to dwell on Kossmann's theory, that the common broad ligament cyst is not of parovarian origin.*

V. Subserous Cysts with Serous Contents; Parovarian Cysts with Albuminous Fluid.

On the other hand, extraperitoneal cysts exceptionally contain a pale yellow, highly albuminous fluid, apparently pure serum. I will

* See his article 'Anatomie und Pathologie des Nebeneierstöckes,' in Martin's 'Krankheiten der Eierstöcke und Nebeneierstöcke.'

relate a case, for it is very important to remember that a fairly large pelvic cyst containing serum may be neither a perimetric cystoma nor in any sense intraperitoneal, but a subperitoneal tumour, independent of the parovarium, or of whatever structure gives rise to the so-called parovarian cyst. But first I must note that Jeanbrau and Moitessier* and others† have reported cases of 'parovarian cyst' containing albuminous fluid. I doubt whether these writers can convince us that the tumour was a true parovarian cyst. It was of great capacity, containing over 39 pints (23 litres) of the clear, albuminous fluid. This, they admit, is an unusually capacious 'parovarian' cyst. It had been for nine years under observation, but we cannot assume that originally its contents were 'parovarian' —that is to say, watery and non-albuminous—the albumen in the fluid removed at the operation being due to blood or inflammatory exudation. Hæmorrhage and inflammation (of which there was no evidence of any kind) would have made the fluid turbid, or given it a deep brown or green colour. But the fluid (specific gravity 1088) was perfectly clear and pale yellow in colour. As in my own case, to be described, it had the characters of the contents of a serous cyst elsewhere. The cyst wall undoubtedly lay between the layers of the broad ligament, with the ovary external and posterior, and its inner wall was lined with cubical epithelium with big nuclei. The last feature is the most convincing as to the alleged 'parovarian' nature of the cyst, as such epithelium is not likely to be found in a cyst developed from a lymph-space; still, epithelial cells may develop in strange places. There was a pedicle, as is seen in many 'parovarian' cysts; but any cyst of any conceivable origin growing between the layers of the broad ligament may drag on that fold so as to fashion for itself a pedicle. In my case it was otherwise, as the cyst burrowed down into the parametrium; but a papillomatous cyst, with watery, non-albuminous contents, and lying between the folds of the broad ligament, may form itself a pedicle, as in Jeanbrau and Moitessier's case,‡ or may burrow down, as in my own. The distinction does not necessarily imply a different origin.

After relating my own experience, I will comment on some of the

* 'Kyste Parovarique contenant 23 Litres de Liquide Albumineux,' *Annales de Gynéc. et d'Obstét.*, vol. liii., p. 99, 1900.

† *Ibid.*, references, p. 104.

‡ We may add to the above pathological and clinical details that the patient was fifty, that her youngest child was twenty-three, and that the cyst was successfully removed by Forgue of Montpellier.

cases of 'parovarian' cysts containing albuminous fluid quoted by Jeanbrau and Moitessier.

CASE 4.—*Fluctuating unilateral pelvic tumour in middle-aged multipara—Pelvic inflammation five years before observation—Exploratory operation: cyst, completely subperitoneal in left broad ligament, serous contents, no true wall—Incision—Cavity packed with gauze—Prolapse of intestine through drainage track — Inflammatory exudation eighteen months later, malignant changes suspected, ultimate subsidence of exudation—Patient well four years after the operation.*

Mrs. M., forty-seven, a Jewess born in Russian Poland, was sent to me on January 14, 1898, by Dr. Gaster of West Hampstead, for a pelvic tumour.

She was a robust woman and very stout. She had been married to her husband, who was still living with her, for twenty-seven years, and had borne ten children, including one pair of twins; the youngest was five years old; she had never aborted.* She had never suffered from any serious illness till after her last labour, when she was laid up with a bad attack of pelvic inflammation; yet she recovered quickly, and remained well for nearly five years. For the last four months she had felt pain in the right iliac fossa. Dr. Gaster detected a tumour on the other side.

I found an obscurely fluctuating tumour occupying Douglas's pouch and the left side of the pelvis, and rising upwards 3 inches above Poupart's ligament. It was of the shape and size of an ostrich's egg, with the long diameter vertical and the big end uppermost, characters not rare in the worst form of burrowing papillomatous broad ligament cyst. The uterus was pushed to the right and drawn upwards; its cavity measured 3 inches. There was no swelling of the legs; the urine, after a few days' rest in bed, was normal (specific gravity 1021, acid, no albumen), though rather scanty (32 ounces in twenty-four hours for two days).

Owing to the shape of the tumour, as above described, I suspected a papillomatous cyst of the broad ligament.

I operated on January 18, 1898. There were no adhesions, nor any other evidence of recent or old peritonitis. The right tube and ovary were perfectly normal. The greater part of the left meso-salpinx was opened up by a cyst, which burrowed deeply downwards, pushing up the peritoneum of Douglas's pouch so as to lie close to the upper part of the rectum. I tapped close behind the Fallopian tube, where the cyst seemed thinnest; nearly a pint of a transparent, yet distinctly pale yellow, fluid came away. It looked very like serum, and quite unlike the absolutely colourless water which is found in papillomatous cysts. I knew at once that the cyst must be of unusual character. I closed the puncture in the cyst with T-forceps, and then opened up the broad ligament. The cystic cavity went down to the deepest recesses of the left side of the pelvis, which, indeed, it lined as though it were finely moulded thin glass. I could see the lower part of the ureter, and observed a large artery pulsating near it. Then I found that there was no cyst wall, the collection of fluid being bounded by what appeared to be a layer of endothelium; in short, the cavity must have been a lymph-space. There were no papillomatous growths on the transparent endothelium, which answered for a cyst wall; but I noted two or three clusters of minute warty growths on the posterior layer of the meso-salpinx. This alarmed me as to prognosis. The sequel will show the importance of a *long* after-history to so doubtful

* Fertility precludes, more or less, any malformation theory explaining the origin of pelvic cysts of doubtful nature.

a case. The ovary was jammed down and backwards out of sight; I could not dissect it up, as such a step was surgically out of the question. The cyst, clearly, had nothing to do with it.

The broad ligament was very vascular. I had to tie several vessels; the bleeding went on, so I ligatured the big ovarian artery and veins much displaced in the infundibulo-pelvic ligament. The Fallopian tube was damaged, so I tied it close to the cornu. Some of the widely-opened ligament was closed with suture. Then I packed the cavity, so as to insure a kind of new Douglas's pouch, widest above, lest it should become a dangerous narrow-necked hernial pouch. I used iodoform gauze.

The fluid described above was neutral or slightly alkaline, specific gravity 1006. There was absolutely not a trace of sediment. On boiling, no precipitate came down; but when nitric acid was added, a dense, pure white precipitate formed—this was increased by boiling. A few drops of the fluid poured on cold nitric acid turned entirely opaque.

On the third day I removed the gauze; it was deeply stained. All went well till the ninth day, when in the morning the patient had a violent fit of coughing, and, as she felt pain afterwards, thought that something must be wrong. The nurse found that gut had come out under the dressings. I was sent for, and cleaned and reduced a foot of small intestine which had prolapsed through the drainage track. Then I closed the peritoneum over the track, and united the integuments over it. The patient did not seem the worse for this accident, flatus passed freely nine hours after the sutures were applied, and neither pulse nor temperature rose. She implored me to give no anæsthetic, and hardly winced when I passed the sutures (two) through the integuments. The handling of the intestine and suturing of the peritoneum seemed to give her no pain whatever. When examined a month after the operation, I found the fornices perfectly free and the uterus movable.

On July 3, 1899, over a year and six months after the operation, I received a letter from Dr. Reginald Brown, of Stoke Newington. She had been seized a few days before with pain and fever. Upon examination, Dr. Brown found a mass in the hypogastric region extending into the right iliac fossa. The mass came down into Douglas's pouch, and seemed on bimanual palpation to be well defined; it was hard, fixed, and *tender to touch*. I dreaded some malignant degeneration. A few days later Dr. W. H. Unwin, then resident medical officer at Charing Cross Hospital, wrote to me for details of the case, as the patient had been sent to that institution under Dr. Amand Routh. The uterus was pushed to the right by an irregular mass in the posterior part of the pelvis. 'The rectum was found to be pushed over to the right of the pelvis, but *is otherwise surrounded by the hard exudation*.'

On January 17, 1900, Mr. Stanley Boyd kindly wrote to me, informing me that he had examined the patient before admission into Charing Cross Hospital, and detected the mass in the pelvis: 'The only point against its being malignant was that she was decidedly febrile when I saw her.' Dr. Gaster that same month wrote to inform me that the patient was then under his care: 'There is no tumour present at all beyond the adherence from the operation—no return of any tumour. She must have had pelvic inflammation.'

On July 31, 1900, I examined the patient. She was well and strong, but suffered from occasional pain in the right side. The uterus was freely movable; its cavity measured 2½ inches. A solid mass in the left fornix, small and not tender, could be felt on examination through the rectum. Dr. Gaster informed me recently (December, 1901) that the patient was in excellent health.

This after-history is now clear. I was alarmed by the few warty growths which I trimmed away at the operation, and suspected that they

might signify malignancy. When I heard from Drs. Brown and Unwin, the after-history seemed to justify my fears. Naturally, they and Dr. Routh and Mr. Stanley Boyd suspected malignancy also. In reality, an attack of pelvic peritonitis had set in, possibly caused by *Bacillus coli* infection of a ligature low down in the broad ligament. It is a common accident, as I happen to know, when ligatures are applied near the bowel, and the symptoms are often delayed till over a year after the operation.

These cases, reported by Jeanbrau and Moitessier and by myself, show that a serous fluid, highly albuminous and unlike either ovarian or parovarian fluid, may be found in a true cyst or encapsuled —probably in a dilated lymph-space—entirely outside the peritoneal cavity. Hence, tapping alone cannot prove that fluid of the character seen in ascites comes out of a 'perimetric cystoma,' as Targett terms it, the pseudo-cyst of serous perimetritis; nor, on the other hand, can it prove that similar fluid comes out of an exceptional type of 'parovarian' cyst.

In the three cases of serous perimetritis which I have described, two, at least, strongly resembled true cysts, as far as palpation could aid me; tapping, for reasons just explained, would have proved nothing. I explored, however, and was thus able to inspect the relations of the cystic cavity. So, also, in Jeanbrau and Moitessier's case the nature of the cyst was revealed more or less clearly at an operation. But these writers weaken their argument concerning the frequency of 'parovarian' cysts with albuminous fluid by quoting authors who relied on tapping alone, as I find from consulting the original articles thus quoted.

Duplay* makes cysts of the broad ligament and of the parovarium synonymous in his paper on the subject. Then he notes how these cysts contain fluid holding but the merest trace of albumen. Still he admits that in one case in his own experience (numbered 7) the liquid procured by tapping was pale yellow, and contained a considerable quantity of albumen. 'It coagulated entirely at 75° C., and also without heating on the addition of a few drops of acetic acid.' On turning to case No. 7 in Duplay's series, I find that the cyst was very large, and the patient was a woman aged fifty. It was tapped one April of over 19 pints of the albuminous fluid above described, and in the following June there was no sign of refilling. This ends the report of the case; the nature of the cyst was never proved. Panas† reports a case after the fashion of Duplay; it was cured by

* 'Des Kystes du Ligament larges (Kystes parovariques),' *Archives de Tocologie*, 1882, p. 712; 1883, p. 23.

† 'Sur une variété particulière de Kystes séreux ovariques,' *Archives de Tocologie*, 1875. The case in question is given at pp. 209 to 211.

tapping, and there was no sign of refilling two months later. The fluid contained 'a small quantity of albumen.' This case is quoted in a thesis on 'Kystes des Ligaments larges' (1882) by Castañeda of Triana, and also by Jeanbrau and Moitessier, yet the cyst was never seen, as in Duplay's case.

The same French writers quote Atlee's case.* There was a cyst-wall, which was extracted. I suspect that it might have been a true ovarian cyst burrowing into the broad ligament. It was tapped first in 1845; the fluid contained no albumen. In 1858 it was removed. Atlee fancied that 'the ovary must have become subsequently diseased, and its morbid secretions had found an inlet into the *old peritoneal cyst*.' The latter words are obscure. Inflammation, of course, might cause albuminous products to mix with parovarian fluid; but the exact nature of the cyst remains uncertain.

Lawson Tait has been quoted in support of the theory that parovarian cysts may hold albuminous contents, but he distinctly declared that he laid no stress on cyst contents. 'In the majority of my cases of parovarian dropsy the fluid has been thick even to viscidity.'† In a report by Dr. McMann of two of Tait's tumours with viscid 'parovarian' fluid, no mention is made of albumen; but Lawson Tait had little faith in clinical diagnosis of this kind.

VI. Clinical and Surgical Considerations.

Summary of the Cases of Serous Perimetritis.—I have endeavoured to explain by clinical evidence that a true serous perimetritis, independent of tubercle, may closely simulate a cystoma or cystic new growth, and have entered into a necessary digression in relation to a kindred subject—subperitoneal serous cysts and parovarian cysts containing clear, highly coagulable contents. It is now advisable to return to the main subject, and to sum up the evidence to be gathered from the three cases above reported. I designedly say *evidence*—indeed, I may be pardoned for saying *proof*. The existence of serous perimetritis is well known, but operators are aware of the uncertainties of diagnosis, and therefore any given case diagnosed as 'serous perimetritis,' and reported as cured by expectant treatment, may represent some error of diagnosis into which we need not enter. They are also aware that exploratory incisions where encysted ascitic fluid is diagnosed not rarely lead to the discovery of a true cystic

* 'General and Differential Diagnosis of Ovarian Tumours,' 1873, case 33, p. 120.

† 'The Diagnosis of Ovarian Tumours from the Characters of the Fluids contained in them,' *Lancet*, i., 1880, p. 205.

tumour with no free fluid. I do not deny that the disappearance of an area of dulness with fluctuation in the hypogastrium, associated with other clinical conditions, is very strong evidence of serous perimetritis cured by rest, etc. Still less do I insinuate that this disease when diagnosed demands an exploratory incision. I mean that it is only by operating as in these three cases that we can *prove* the existence of serous perimetritis.

The evidence gleaned from these cases is worth considering for the reasons just given. Serous perimetritis is often associated with a very distinct history of pelvic inflammation (Cases 2 and 3), but such a history may be entirely absent (Case 1), and this fact may serve to distinguish a perimetric hydroperitoneum from serous perimetritis, but such a distinction cannot be founded on one case. Serous perimetritis may be associated with sterility (Cases 1 and 2), or may occur in a multipara. This is what might be expected, as both these types of women are exposed to causes of pelvic inflammation. There is a collection of fluid in the lower part of the abdomen, forming a tumour, often flaccid (Case 1). The fluctuation is often obscure (Case 2). The fluid may press down very distinctly in Douglas's pouch (Case 1), or into one lateral fornix (Case 3), or may not distinctly extend into the pelvis at all (Case 2). In the latter case exploration shows that the peritoneal cavity is closed in the pelvis by adhesions. In some instances (Case 3) the tumour feels as though laterally movable. The uterus tends to be displaced upwards and forwards (Cases 1 and 2). Just as the tumour may feel when handled above as though movable, it may seem to move with the uterus on bimanual palpation (Case 3). The period may be perfectly regular, and was so in all three cases, though the Fallopian tubes are often closed or bound down by adhesions. The temperature is normal.

The cyst is always thin-walled. In tuberculous encysted dropsy, excluded as above understood, the wall is usually very thick. Its upper part—organized inflammatory membrane running across coils of intestine, or between the uterus and intestine—has often large vessels, and can be trimmed away from adjacent organs, but inferiorly it merges into the peritoneum of Douglas's pouch, which may be healthy (Cases 1 and 3), or else more or less obliterated by adhesions (Case 2). Sometimes the anterior part of the cystic cavity is simply walled in by thickened parietal peritoneum. This was not observed in any of the three cases, and is probably rare. As a rule, the cavity is formed in the manner explained above, a collection of serum in the pelvis being cut off from the parietal peritoneum of the

hypogastrium by plastic lymph thrown across between viscera. The organizing and stretching of this lymph produces the anterior and superior part of the cyst wall. On the other hand, in tuberculous cases I have repeatedly found that the thickened parietal peritoneum forms the anterior wall of the cystic cavity, developed between coils of gut adherent to the parietes. On opening the cystic cavity in these non-tuberculous cases the ovary is seen to hang from its anterior wall. This relation is specially characteristic, and may be very clear (Cases 1 and 2); but the ovary may be displaced downwards (Targett's case) or outwards, and hard to define, especially when there has been long-standing inflammation (Case 3). The fluid is highly albuminous, and has all the appearances of ascitic fluid. It is bright yellow or greenish-yellow, and not glairy.

Treatment.—Acute serous perimetritis, with a clear history of recent pregnancy, abortion, or gonorrhœal infection, should be treated by rest and local applications. Pressure symptoms may be severe; then, if the fluid can be felt in Douglas's pouch, that pouch may be tapped through the vagina, with every reasonable precaution. In these acute cases an abdominal incision is unjustifiable, and tapping should never be practised above the pubes.

We have to do in these notes with chronic cases of serous perimetritis simulating cystic tumours. The patient is worried by the presence of a tumour. An exploration is often necessary for diagnostic purposes. It is far graver to delay the removal of a papillomatous cyst or any similar cystic tumour than to open a collection of serum which might have been absorbed if left alone. The most experienced gynæcologist must be indeed confident if he feels sure of many of these obscure cystic collections. Dr. Herman is an excellent teacher. Let us turn to p. 198 of his 'Diseases of Women,' and we shall see that he admits the difficulty of diagnosis in these cases, whilst the rules which he lays down would not have been perfect guides in the three cases under my care.

'The points of diagnosis are these: (1) In serous perimetritis the formation of the tumour is preceded by symptoms of inflammation, pelvic pain, and fever. Small ovarian tumours cause neither pain nor fever.' But in Case 1 there was no history of inflammation, and pelvic cysts, even when small, may become inflamed. '(2) The tumour formed by serous perimetritis is fixed; a small ovarian tumour is movable.' But small ovarian tumours may be fixed by inflammatory adhesions, and in Case 3 the viscera around the cyst cavity could be moved, so that the cyst was literally movable to a slight extent. In displacing the viscera the hand was, in fact, displacing

a cyst wall. '(3) The tumour in serous perimetritis is usually bounded in front by coils of bowel matted by adhesions; therefore it is generally resonant on percussion, while an ovarian tumour is dull.' In Cases 1 and 3 there was dulness on percussion, in Case 2 resonance over the upper part of the fluctuating area. All were chronic, the plastic lymph had stretched to form a cyst wall as above explained, none were more recent cases where closely adherent coils of gut close in the pelvic peritoneum. Again, small inflamed ovarian cysts not rarely have adherent intestine between them and the parietal peritoneum.

This distinguished and experienced teacher, I must add, dwells on complex cases, but he relies too much on the effect of rest, iodine applications, etc. Case 2, I admit, might possibly have recovered without incision, but in Cases 1 and 3 it seemed more than doubtful if rest would have insured absorption. I am not speaking of recent cases, I repeat; of the treatment of such there can hardly be two opinions.

We have to deal, then, with a cystic tumour unassociated, except in its past history, with acute symptoms. We have reason to suspect that the tumour is a 'perimetric cystoma.' An exploratory incision is necessary, for diagnosis is never certain in these cases, and a true new growth is dangerous to overlook; the mere presence of an abdominal swelling is objectionable to the patient. The exploratory incision, granted that diagnosis is right, reveals the conditions described in the report of the three cases.

Possibly some surgeons would advocate closing of the abdominal wound after emptying the fluid and drying the cavity. But there are distinct objections to this practice. If the puncture in the pseudo-cyst wall be sewn up, the cavity will probably fill up again, and possibly the fluid will then be septic. If not sewn up, it may close up if small, with the same results as when sutured; whilst if it has been enlarged, a dangerous trap for small intestine is left in the abdominal cavity. Hence it is best to drain, so as to obliterate the cavity; as said above, gauze is better than rubber tubes, but if packed in firmly it may obstruct (Case 3.). An ovary is often unhealthy, and is then, perhaps, best removed, as an exciting cause of the effusion, but it must first be carefully examined. The false membrane which forms the upper part of the cyst should be freely trimmed away; its vessels require careful ligature, as they are apt to bleed freely, and forcipressure is not always sufficient. The cut edge, after trimming, should be brought to the lower angle of the wound, being made narrow by a purse-string suture. The reason is

given above: the cut edge would otherwise form the narrow neck of a big hernial pouch, into which small intestine could readily slip. Drainage is then easily maintained, the cavity soon closes up, and, remembering its boundaries, we must avoid hastening closure by the use of too strong stimulating lotions.

To return to the point where I began, chronic serous perimetritis is more interesting as a somewhat mystifying malady than satisfactory as a disease easy to distinguish and favourable for the display of operative dexterity. For that reason it has, perhaps, been neglected, and therefore I have followed the good example of Griffith and Targett, and turned attention to it, even if I have failed in adding anything absolutely original to our knowledge of the subject.

TWO SPECIMENS OF PLACENTA PRÆVIA.

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THE specimen represented in Fig. 1 was obtained from a woman who died in the Royal Victoria Hospital, Montreal, in February, 1898, of pernicious vomiting. The woman was practically moribund on her admission. She had been ill during several weeks, and had become greatly emaciated. The abdomen and pelvis were removed unopened, and then frozen. A vertical mesial section was made, the surface of the left half being drawn by Professor Adami (to whom my thanks are due for his kindness in undertaking this task during my illness).

The uterus is placed almost mesially, its highest point lying just below the level of the middle plane of the brim. The organ lies abnormally far back in the pelvis, the cervix being close to the coccyx. This position was evidently congenital, as no inflammatory remnants were present. The os externum is close to the top of the coccyx, just below the level of the bony outlet of the pelvis. The cervix presents some degree of hypertrophic elongation. The uterine body is somewhat rounded, being slightly moulded by the bodies of the sacral vertebræ. The fundus rests against the anterior abdominal parietes. The wall varies in thickness; anteriorly it averages about 5 millimetres. The posterior wall has this thickness near the cervix, but it increases towards the fundus; its greatest measurement is obtained opposite the first sacral vertebra, where it is 1 centimetre.

Of great interest is the presence of a distinct decidua reflexa. Its greatest extent is shown in the vertical mesial section, where it may be traced from a point 9·5 centimetres above the os internum posteriorly, to one 6 centimetres above it anteriorly. Its average thickness is 1·5 millimetres. It is separated from the decidua vera by a narrow slit (space of the hydroperione), containing clear fluid. Just above the cervix anteriorly this slit is widened, forming a space 4 millimetres in width. The placenta is attached mainly to the upper portion of the anterior uterine wall and to the fundus, but it is developed on the decidua reflexa, both in front and behind. Anteriorly the reflexal portion reaches to within 6 millimetres of the os internum, being thick and well developed. Posteriorly the

placenta extends on the reflexa 3·6 centimetres, being much thinner than the anterior portion, and considerably degenerated.

The specimen represented in Figs. 2 and 3 is in the obstetrical collection of Rush Medical College. It is a pregnant uterus, in which gestation is advanced to about the same period (end of third month) as in the specimen already described. The preparation is

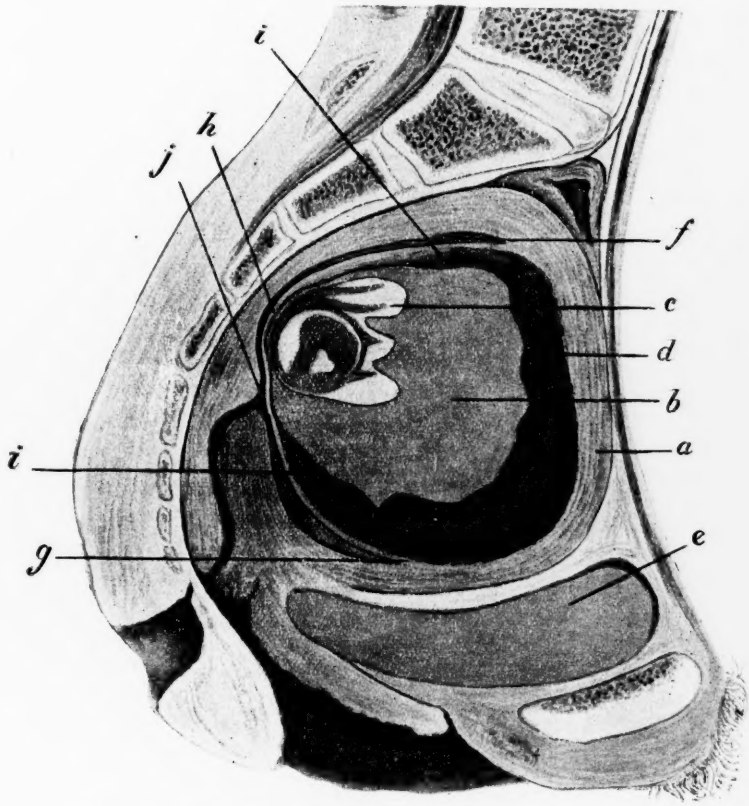

FIG. 1.—VERTICAL MESIAL SECTION OF PELVIS OF WOMAN AT END OF THIRD MONTH OF PREGNANCY.

somewhat elongated vertically, and narrowed horizontally by its suspension in a jar. The lower part of the cervix has been cut away. The body wall shows no differentiation into upper and lower segments. Immediately above the cervix its thickness is about 8 millimetres. The posterior wall measures the same, the anterior wall being slightly thicker. The decidua reflexa exists as a thin

membrane, which lies in contact with the posterior wall of the uterus. Its upper limit is at the fundus, its lower at the os internum. Its thickness near the placenta is about 2 millimetres; in the rest of its extent less than 1·5 millimetres. The placenta is situated on the anterior uterine wall, which it mostly covers. Its upper end is at the fundus; its lower end at the os internum, where

FIG. 2.—VERTICAL MESIAL SECTION OF PREGNANT UTERUS AT END OF THIRD MONTH OF PREGNANCY (RIGHT HALF).

it is attached for ⅜ inch to the reflexa. Its inferior margin, together with the adjacent reflexa, is considerably torn by blood extravasation, which forms a clot about the size of a small hen's egg lying in the left half of the uterus, between the decidua reflexa and decidua vera, immediately above the os internum. This blood has escaped partly from sinuses in the reflexa, partly from the intervillous spaces of the placenta itself, which have been opened.

Remarks.—These specimens are of particular interest in relation to the question of the origin of placenta prævia.

The majority of the earliest obstetrical writers—*e.g.*, Mauriceau, Astruc, Dionis, Daventer, Pugh, and others—held that the ovum in cases of placenta prævia had not developed from the beginning in

Fig. 3.—Vertical Mesial Section of Pregnant Uterus at End of Third Month of Pregnancy (Left Half).

the lowest part of the uterine cavity, but that it had originally been attached in the normal upper zone, from which it had become accidentally loosened, falling by its own weight to the lower zone, where it continued its development.

Portal appears to have been the first who described placenta

prævia as having arisen from the implantation of the ovum in the lower part of the uterus from the beginning. His view was held by several other authorities—*e.g.*, Roederer, Levret, and Smellie—and it was mainly due to the latter's writings that it became generally accepted.

In 1888 Hofmeier, at the German Gynæcological Congress, held in Halle, advanced the opinion that placenta prævia is due to the development of villi of the chorion læve, which are attached in the early stages of gestation to the decidua reflexa, and which normally atrophy. He believed that as the latter became absorbed or blended with the vera these villi remained functional, forming the lower portion of the placenta, continuous with the serotinal or true placenta.

In 1890 Kaltenbach adopted the same view, and proposed that the placenta be considered *prævia* when attached over the lower pole of the reflexa. This view has been enthusiastically received in many quarters, and several specimens have been exhibited in recent years clearly demonstrating the reflexal placenta. Such a one is that represented by me in Fig. 1.

That placenta prævia is always formed in this way cannot, however, be held. My second specimen, represented in Figs. 2 and 3, proves conclusively that the condition may arise from a chorion frondosum developing normally in relation to a decidua serotina situated from the beginning in the lower portion of the uterine body.

Gottschalk in 1897 described a specimen demonstrating the same fact. Kaltenbach has stated that a primary implantation of the ovum near the os internum is unlikely, because of the nearness of the cervical canal, down which the ovum would probably pass. This speculation is of no value, in view of the demonstration of such specimens as Gottschalk's and mine.

In some cases placenta prævia may be due to a combination of the conditions mentioned—viz., primary low implantation of the ovum and persistent chorionic development on the reflexa. In my second specimen both conditions exist, though the amount of placental tissue attached to the reflexa is very small.

The explanation of primary low implantation of the ovum is a matter of pure speculation. Whether the ovum is carried down by the action of cilia on the cells of the uterine mucosa, by the movement of fluid in the cavity, or by mechanical displacement, we do not know; nor are we able to say anything regarding the possibility that the ovum may have some power of movement in itself, or exercise some function of selectiveness.

Hart has advanced the hypothesis that the ovum grafts itself only on connective tissue, and that, if it does not meet such a surface until it reaches the lower part of the uterus, attachment and development in the latter position necessarily leads to the formation of placenta prævia. This hypothesis cannot be entertained in the light of recent embryological researches. The ovum undoubtedly develops in relation to the connective tissue of the mucosa, but it reaches this tissue by eating its way through the surface epithelium, owing to the phagocytic activity of the cells of its epiblastic covering. It is, therefore, not necessary that it should find a ready-made raw surface.

One simple yet feasible reason may be advanced to explain a low primary implantation of the ovum—viz., fertilization of an ovum by spermatozoa in the lower part of the uterine cavity. Of course, there is at the present time a widespread belief that this process generally takes place in the Fallopian tube, but no one can presume to say that it always occurs there. It is, indeed, not at all unlikely that occasionally the ovum and spermatozoa may meet in the lower part of the uterus, producing low implantation and development.

The explanation of placenta prævia resulting from a reflexal placental formation may be undertaken with more facts and less speculation. Hubert Peters has described the earliest stage in the formation of the human reflexa. He has shown that the young ovum, on becoming attached to the uterine mucosa, sinks rapidly into the compact layer, excavating laterally as well as deeply. The overhanging portion of the compacta forms the reflexa, the gap through which the ovum entered being closed by the organization of blood-clot.

The thickness of the reflexa must depend to a considerable extent upon the amount of excavation caused by the ovum, though it also varies according to the thickness of the mucosa at the site of embedding, and according to the degree of decidual development taking place. The basal part of the reflexa is always the thickest part, and is similar to the neighbouring compact layer of the serotina in early pregnancy. The layer thins towards the outer polar part, showing less vascularization, and tending to undergo early degenerative changes. Blood extravasation is frequent in the substance of the reflexa, coagulation necrosis in the decidual tissue constantly occurs, and blood-channels become closed.

In the earliest changes which take place in the outer epiblastic covering of the ovum, no distinction can be traced between the portion related to the reflexa and that related to the serotina; neither

is there any distinction between the villi during the first few weeks of gestation. Gradually differences are noted, the villi of the chorion læve (those in relation to the reflexa) showing less growth tendency the farther they are from the serotina. As pregnancy advances, retrogressive and degenerative changes occur in them; fibrin-formation takes place in the maternal blood between the villi and on the inner surface of the reflexa.

There has been some difference of opinion as to the relationship between the degenerative changes in the reflexa and those in the villi related to it. There can, however, be very little doubt that the degenerated condition of the reflexa is the occasion of retrogression in the villi attached to it. Of these villi, those nearest the serotina become most developed, and are the last to degenerate. This is due to the fact that the basal reflexa to which they are attached is most developed and degenerates most slowly.

In certain cases in which there is abnormal growth and continuance of a portion of the chorion læve, forming the so-called reflexal placenta continuous with the serotinal placenta, there seems to be an exceptional development of the decidua reflexa, especially near the serotina, the degenerative changes being much less marked than in ordinary cases. In my specimen the basal part of the reflexa was well vascularized, showed very little necrosis, and resembled greatly the neighbouring serotina.

From my examination of complete abortion sacs, I am convinced that the formation of a partial reflexal placenta is a much more frequent occurrence than is generally believed. I also believe that the condition plays a considerable rôle in the causation of abortion. As a result of the gradual thinning of the reflexa, together with the intrinsic necrotic changes which I have described, rupture of its substance, with consequent hæmorrhage, may easily be brought about. One of my specimens (Fig. 3) illustrates this condition. The extravasated blood between the reflexa and the os internum is due to rupture of a small portion of the reflexa, to which well-marked chorionic villi are attached continuous with those of the serotinal placenta.

If there be no disturbance of gestation in the early months, there may be in the later months. These variations probably depend mainly upon the degree of preservation of that part of the reflexa to which the placenta is attached, and the amount of blending with the vera which takes place. It has long been held that in normal pregnancy the reflexa gradually merges with the vera, so that it more or less forms the inner layer of the latter during the advanced months.

The work of Minot, E. Frankel, and myself has shown that blending occurs only to a partial extent and in varying degrees.

During the fourth month I have sometimes found the reflexa distinguishable as a continuous thin hyaline membrane lying in contact with the vera, but more frequently as a broken layer, parts of it being absent, the remains of the degenerated chorion læve at these breaks lying against the vera. During the fifth month fewer traces of the reflexa are usually found. During the later months small portions may be sometimes noticed as patches of fibrin containing degenerated villi.

When there is no early interruption of gestation in the condition of reflexal placenta, the occurrence of hæmorrhage in the later months is probably mainly determined by the state of that part of the reflexa to which the villi are attached, and by the extent and nature of the union which may have taken place between it and the decidua vera. Should there be firm union, hæmorrhage would be less likely to occur during pregnancy than if it were absent. When a case progresses to the seventh or eighth month, hæmorrhage then taking place, the explanation is that there has been an unusually thick or strong reflexa, that degeneration has taken place very slowly or to a slight extent, and that the mechanical stretching which the membrane normally undergoes has not been able to produce an earlier rupture of its substance. If a case of reflexal placenta continues to full term, it is probably one in which firm blending has taken place between the reflexa and vera.

The great majority of cases of placenta prævia which go to term are probably those in which there has not been a reflexal placenta, but in which the ovum has been implanted low in the uterus from the beginning. In these cases hæmorrhage need not be expected until canalization of the cervix and lower uterine segment has begun, producing that disproportion between the placenta and the area of its attachment on the uterus which inevitably results in the loss of blood.

Bayer and others have tried to explain the hæmorrhage occurring in cases of placenta prævia previous to full term by the old view that the upper portion of the cervix was taken up to form part of the lower uterine segment during the late months, in this way bringing about a separation between uterus and placenta. This explanation no longer can claim attention, since anatomical investigations have abundantly proved that the cervix does not enter into the formation of the lower uterine segment during pregnancy. Another explanation has been put forward, to the effect that the diameters of the lower

segment of the uterus increase during the last months of gestation, and that the increase in area leads to a separation of the placenta. Anatomical facts disprove this view also. The full capacity of the lower uterine segment is ordinarily attained by the fifth month. Thereafter the great increase in the uterus is almost entirely due to a development of the upper portion.

It is to be noted that the lower uterine segment has no definite upper boundary in pregnancy; the latter is determined by the retraction ridge, which develops only after labour begins. The exact "Anlage" of this ridge or ring in the wall of the pregnant uterus is not accurately known, variations being found in its position. Moreover, while its distance above the os externum has been measured in Chiari's, Braune's, and Barbour and Webster's second stage specimens, in which the cervix is fully dilated, its distance above the os internum is not definitely known, since the latter cannot be accurately determined. The information afforded by frozen sections of first-stage cases is not sufficient to establish the "Anlage" of the retraction ridge. It can be approximately placed at a distance of $1\frac{3}{4}$ to $2\frac{1}{2}$ inches above the os internum, being longer posteriorly than anteriorly; it varies in position in different cases.

In examining specimens of the pregnant uterus, it may be impossible in some cases to state whether the placenta should be considered as prævia or not.

SUMMARY.—1. Three different sets of conditions explain the occurrence of placenta prævia:

(*a*) Low implantation of the ovum.
(*b*) Development of chorionic villi on the decidua reflexa, forming a reflexal placenta.
(*c*) Low implantation of the ovum, together with a reflexal placenta.

2. Reflexal placenta prævia is probably a frequent, though generally unrecognised, cause of abortion and miscarriage, the degenerated reflexa becoming thinned and torn, leading to hæmorrhage.

3. Cases of placenta prævia which reach full time are probably, in most instances, those in which a reflexal placenta has not been present, but in which the ovum has been implanted low in the uterus, the serotina thereby lying partly or entirely in the lower uterine segment.

4. Cases of placenta prævia in which gestation is not interrupted until the late months are probably, in most instances, those in which a reflexal placenta exists, the late appearance of hæmorrhage being

due to unusual strength and thickness of the reflexa and to slow advance of degenerative changes in it. Persistence of a reflexal placenta prævia to full term is probably a very rare occurrence, and is explained by non-rupture of the reflexa because of the above-mentioned characteristics, or by firm blending of the reflexa with the vera. Hæmorrhage occurring in the late months of pregnancy, when the placenta prævia is not reflexal in origin, is probably generally due to some degree of dilatation of the cervix, which may or may not be the earliest sign of premature labour. The onset of labour with consequent increasing dilatation of cervix and lower uterine segment necessitates further disproportion between the placenta and the site of its attachment, and increasing separation.

5. In all conditions of placenta prævia hæmorrhage may result from various causes, which are entirely independent of the position of the placenta.

6. In a considerable proportion of cases in which uterine hæmorrhage occurs in advanced pregnancy, where the diagnosis of accidental hæmorrhage is made, probably placenta prævia of reflexal origin is present. Unless the placenta be within easy reach of the examining finger, a careless observer might easily conclude that its attachment had been normal. A thorough study of the shed placenta and membranes is necessary to establish the true nature of these cases, though it may sometimes be inconclusive because of disturbed and altered relationships. The abnormalities found in the placenta in many cases of placenta prævia are probably almost entirely produced when the condition is reflexal in origin. Thus, the placenta may be much spread out and thinned, sometimes covering a large area. Many variations may be found in its development. Some parts may be well formed; others may be more or less degenerated, the villi being largely destroyed and surrounded with fibrin. Sometimes it has a patchy appearance. Detached portions (placenta succenturiata) may be found. The outline may vary greatly, and may be round, oval, reniform, lobed. The cord frequently has an eccentric attachment; sometimes it enters the placenta at the border or has a velamentous insertion. It has been widely taught that these placental peculiarities are due to the development of the placenta in the lower uterine segment, where the decidual layer was believed to be thin and not well formed. Such a view is absurd. The mucosa is as well developed in the lower uterine segment as in the upper portion of the uterus, and the decidual changes are just as well marked in it. The chorion may develop as well in relation to it as to the decidua in the upper part of the uterus, nor are placental abnormalities more

likely to be present. The explanation of the latter is to be found when the chorion continues to develop in relation to the reflexa, the many variations being largely due to the varying degrees of growth and degeneration in the reflexa and to the extent and persistence of the blood circulation in its substance.

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EXPLANATION OF FIGS.

Fig. 1.—Vertical Mesial Section of Pelvis of Woman at end of Third Month of Pregnancy. *a*, Fundal portion of uterine wall; *b*, Liquor amnii; *c*, Fœtus; *d*, Serotinal placenta; *e*, Bladder containing urine; *f*, Space between decidua vera and decidua reflexa; *g*, Junction of reflexa and serotina on anterior uterine wall; *h*, Decidua reflexa; *i*, Reflexal placenta; *j*, Os internum.

Fig. 2.—Vertical Mesial Section of Pregnant Uterus at end of Third Month of Pregnancy. (Right half.) *a*, Fœtus; *b*, Serotinal placenta; *c*, Decidua reflexa, with reflexal placenta attached for short distance; *d*, Decidua reflexa (it has fallen inwards on the fœtus); *e*, Part of the cervix. (Reduced one-fourth.)

Fig. 3.—Vertical Mesial Section of Pregnant Uterus at end of Third Month of Pregnancy. (Left half.) *a*, Amniotic cavity; *b*, Serotinal placenta; *c*, Lower end of decidua reflexa, with placenta attached, torn by extravasated blood; *d*, Blood-clot between decidua reflexa and decidua vera; *e*, Upper portion of blood-clot lying between the decidua reflexa and decidua vera; *f*, Anterior uterine wall; *g*, Amnion slightly elevated. (Reduced one-fourth.)

THE RELATION OF VENTROFIXATION TO SUBSEQUENT PREGNANCIES.

BY

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As the whole question of the ultimate effect produced upon a patient by the operation of ventrofixation is too vast to be considered fully in the space at our disposal, only that section of the subject which refers to its effect upon subsequent pregnancy and labour will be here taken up, and no attempt will be made to weigh the merits of the different operations for holding the fundus uteri forwards except in this respect.

In order to intelligently discuss the question, it is necessary that something should be said of the various methods of performing this operation, which, as we are constantly on the watch for an ideal operation, are legion. One operator uses permanent buried sutures, another absorbable buried sutures, a third removes the sutures, etc.; some fasten the anterior, others the posterior surface of the uterus to the peritoneum of the anterior abdominal wall; while another advocates the passing of the stitches through denser and stronger tissue, such as the sheath of the rectus abdominis muscle.

Let us see what a few of the leading operators and teachers of gynæcology say upon this subject, always bearing in mind that the person to be operated upon is a woman who will probably be exposed to the risks of a subsequent pregnancy.

Olshausen fastens the uterus to the anterior abdominal wall by passing silkworm-gut sutures through the parietal peritoneum, and then through the anterior surface of the uterine cornu.

Leopold passes three silkworm-gut sutures through the whole thickness of the abdominal wall and then through the uterus, passing one through each cornu and the third between them. Before these sutures are tied, the anterior surface of the fundus is scarified, so that it becomes adherent to the anterior abdominal wall

by a broad, firm adhesion. These sutures are removed before the patient leaves hospital.

Pozzi uses a continuous silk suture; this includes the uterus and all of the tissues forming the anterior abdominal wall except the skin. He begins at the lower angle of the wound, and after two or three turns have been taken, includes the fundus uteri until it has been firmly fastened up, at which point this suture is tied and cut off; the rest of the wound is then closed by two rows of continuous catgut suture.

Herman employs both buried and through-and-through sutures. A silk suture is passed through the whole thickness of the abdominal wall, across the top of the fundus from one Fallopian tube to the other, and out again through the abdominal wall on the other side of the incision. Next a catgut suture is passed through the rectus on one side, across the fundus $\frac{1}{4}$ inch behind the silk suture, and then out through the rectus of the opposite side, not including the peritoneum. A similar suture is passed $\frac{1}{4}$ inch in front of the silk one, this latter being removed upon the patient's convalescence.

Sutton and Giles use one or two silkworm-gut sutures through the peritoneum of the anterior abdominal wall and across the anterior surface of the uterus.

Lewers includes muscle on both sides, and passes a *silk* suture through the fundus 'rather nearer to the anterior than the posterior aspect.'

Howard Kelly throws the uterus into a position of 'decided anteflexion.' He passes the fixation sutures, which are of silk, through peritoneal and subperitoneal tissues, and then across the posterior wall of the uterus, the first 1 to 2 centimetres behind a line joining the uterine extremities of the Fallopian tubes, and the second 1 centimetre behind the first.

W. P. Dorsett's is the latest form of operation. He passes a suture of kangaroo tendon through the anterior sheath of the rectus, and around the inner border of this muscle, emerging from the posterior layer of the sheath $\frac{1}{8}$ inch external to the middle line. It then passes through the subperitoneal tissue and peritoneum, and pierces the anterior surface of the uterus, which it traverses. The abdominal wall on the opposite side of the incision is treated in a similar manner to the other. Before tying this suture (two of which may be used about $\frac{1}{4}$ inch apart), the fundus is scarified, so as to produce a broad adhesion.

The above are the different methods of performing this opera-

tion. Let us see what effect they are said to have upon future gestation.

Herman says that 'it does not always cause difficulty in labour, and in the cases reported as illustrating such difficulty I am not sure that the ventro-fixation was the cause.'

Sutton and Giles acknowledge that the operation has been followed by difficulties during labour in a small proportion of cases, but that risks of such trouble are small when the operation is performed in the manner advised by them.

In forty-nine cases of ventrofixation Kelly reports fourteen pregnancies, in only one of which could any untoward result be traced to the operation, and then it was due to suppuration at the site of the fixation causing too firm an attachment. While fourteen cases are too few upon which to found an opinion, they form a strong argument in favour of the contention that abdominal hysterorrhaphy has but slight, if any, injurious effect upon subsequent pregnancies, when it is remembered that this writer not only stitches the uterus forward, but fastens it in a position of 'decided anteflexion.' Surely, if any method of performing this operation would have a deleterious effect, it would be one in which the uterus was held in a position which is pathological.

The operations of Dorsett, Leopold, and Pozzi cannot be recommended in the case of women liable to subsequent pregnancies, as the adhesions formed are too firm to yield during enlargement of the uterus.

The best method of operating is, in my opinion, that advocated by Sutton and Giles, as the uterus is not firmly fastened against the abdominal wall, but only to the peritoneum, which subsequently yields sufficiently to form a suspensory ligament, thus allowing the uterus a fair amount of mobility, and freedom to enlarge in all directions should it become the seat of a gestation. In the majority of cases this false ligament stretches during pregnancy, and after labour resumes its natural condition, together with the rest of the tissues. This was well shown in two of my own cases, where I had to reopen the abdomen several months after patients upon whom I had previously performed ventrofixation had been naturally delivered at the eighth month, the labour in both cases being brought on by accidents. In each case the uterus was lying in good position, and the ligaments were from 3 to 4 centimetres long, and 1 centimetre wide. When operating upon women during the child-bearing period, I usually pass two silkworm-gut sutures through the peritoneum alone of the abdominal wall, but so as, if possible, to include the

urachus in the stitches, and then across the anterior surface of the fundus, passing the sutures at such a level in the abdomen that the uterus is lifted clear of the bladder. Very often the peritoneum is too thin to form a sufficiently strong support to hold up the uterus. One does not wish to permanently retain the organ in an immobile position against the abdominal wall, as would be the case if either fascia or muscle were included in the stitch, so that a happy medium may be attained by including the urachus in the ligature, thus ensuring a strong yet elastic ligament. This and the fixation of the uterus by its anterior surface are the two most important points in the operation. The latter is secured by passing the suture across the centre of the anterior surface of the fundus about 5 millimetres in front of a line joining the uterine extremities of two round ligaments. This allows of the equal elongation of both the anterior and posterior uterine walls during the progress of gestation, and prevents the dragging downwards and forwards of the fundus, with the resulting misdirection of uterine force during labour.

In no class of cases do the after-results relating to pregnancy depend more upon the method of performing an operation than in this, and therefore, when stating the effects of ventrofixation upon pregnancy, one should have accurate knowledge as to the exact manner in which the proceeding had been carried out. For this reason I have disregarded the reports of cases operated upon by others (with the exception of one case reported by Dr. W. C. Mills, of Chateaugay, New York, whom I know to follow the same form of operation as I do), although at present I can only get together the reports of five of my own operations which were followed by pregnancy. Of these six cases, the post-operative labour was instrumental but easy in three (in two of which the previous labour was instrumental, and in the third non-instrumental). In the other three the post-operative labour did not call for the use of instruments. One of the latter was a primipara, while the other two were parous women, but the nature of their previous deliveries could not be ascertained. In five cases the uterus was found in good position some months after child-birth, but in one case the labour was again followed by retroversion, probably owing to the patient being a single woman who had to return to work too soon after confinement.

These good results must be attributed to—first, the care with which the suture was passed across the anterior surface of the fundus in the middle line; second, to inclusion of the peritoneum only of the anterior abdominal wall, and at times also the urachus, in the suture; and, third, to the stretching of the false ligament, and also

of the peritoneum of the anterior abdominal wall, caused by the steady enlargement of the abdomen. This latter caused the abdominal insertion of the false ligament to rise to a slightly higher level than it was before the pregnancy began.

The following are the cases:

Case 1.—Mrs. N. P., thirty-eight years of age, on February 2, 1900, was subjected to curetting, amputation of the cervix, double colporrhaphy, and ventrofixation. Previous to this she had given birth to three full-term children, and had miscarried twice. All of her labours had been extremely difficult and painful, the first two being terminated by the high application of the axis-traction forceps, necessitated by a certain amount of pelvic contraction. On October 1, 1901, Dr. D. J. Evans delivered her of a large full-time child, the labour again requiring high application of the forceps, on account of the head being retained at the brim after full dilatation had occurred. The patient stated that this had been her easiest labour, and it was followed by no complications.

On November 15, 1901, Dr. Evans kindly examined this patient and found the uterus in good position.

Case 2.—Mrs. F. W. B., twenty-eight years old, underwent a curetting, posterior colporrhaphy, igni-puncture of both ovaries, and ventrofixation, on April 4, 1899. Before this she had given birth to one full-time child, forceps delivery, and had once aborted. On December 4, 1900, Dr. Alex. Stewart delivered her of a large full-time male child, the case being a very easy forceps delivery. Her convalescence was uninterrupted, and the uterus remained in good position after everything was over.

Case 3.—Mrs. M., aged twenty-five years. Curetting, left oöphorectomy and ventrofixation were done during the month of March, 1897. She had previously given birth to two full-time children, nature of labours unknown. In February, 1898, Dr. W. Molson delivered her of an eighth month child, the labour having been produced by a very severe fall. The delivery and subsequent convalescence were quite uneventful, and she had suffered from no disturbance while carrying the child.

This patient's abdomen required to be re-opened on April 20, 1898, for disease of the remaining ovary, and the false ligament was seen to be in perfect condition, and to be keeping the uterus in place.

Case 4.—Mrs. S. (reported by Dr. W. C. Mills) had an uneventful labour, terminating naturally, after having had a ventrofixation. There was some delay in actual delivery after the membranes had ruptured, and the after-pains were severe for the first three days.

Case 5.—An unmarried woman had ventrofixation performed for retroversion of the uterus. Three months after leaving hospital she became pregnant, and nine months later was delivered of a well-developed child, the labour being non-instrumental. Both pregnancy and puerperium were uneventful. I regret to say, however, that in this instance the old retro-position of the fundus returned.

Case 6.—The sixth case is that of Mrs. W., whose labour is here described by Dr. Cameron. On November 23, 1900, this patient, aged twenty-eight, was admitted to Ward G of the Montreal General Hospital, complaining of pain across the back and in the left inguinal region, of occasional attacks of increased frequency of micturition during the day, and of something protruding from the vulva, these symptoms beginning three and a half years previously. She had been married for seven years, during which time she had given birth to two full-time children and had once miscarried. Both labours were non-instrumental, the last having taken place three years and a half ago. Local examination of the genitalia

revealed laceration of the perineum, with prolapse of the posterior vaginal wall. The cervix was low and the seat of a bilateral laceration, while the fundus was low, slightly enlarged, and lying forward on the bladder. The uterine appendages were healthy.

On November 26 the uterus was curetted and the cervix repaired, as was also the perineum, Martin's operation being the one chosen. The abdomen was next opened, and the uterus stitched to the peritoneum of the anterior abdominal wall after the manner previously described, two silkworm-gut sutures being used. The abdominal incision was then closed by three layers of sutures, continuous catgut for the peritoneum, buried interrupted silkworm-gut for the fascia, and a row of sutures of the same material for the skin. The patient's recovery was uneventful, and she left hospital on December 18, twenty-two days after the operation.

She was admitted to the Montreal Maternity Hospital October 15, 1901, was confined October 16, and discharged October 30.

During pregnancy there were no special symptoms, except that she felt some pain in the *right* side during the latter months, and she found it uncomfortable to lie on that side on account of a dull, dragging pain, which disappeared when she turned on the other side or on her back. The first symptom of labour was rupture of the membranes and the escape of a large quantity of liquor amnii at 11.30 p.m., October 14. A couple of hours later she was seen by Mr. J. F. C. Forster, who had charge of her case. She was then complaining of sharp, cutting pain over the pubes and of a dragging sensation in the hypogastrium when she lay on the right side. The bladder was empty. On examination the head was found in the pelvic inlet, the occiput to the right, and the anterior vaginal wall was somewhat prolapsed; the cervix was high up and held closely against the pubes; the os was soft and patulous, and the presenting head could be felt when the examining finger was pushed up through the cervix. The external pelvic measurements were: spines, 24·5 centimetres; crests, 26·5 centimetres; external conjugate, 19·5 centimetres. The temperature was normal, the pulse 95, and labour pains were absent. Her condition remained unaltered throughout October 15, and until noon on the 16th, when strong pains set in. She was brought to hospital at 1.30 p.m. At 5.30 p.m. the os was well dilated and the pains were strong and bearing down. At 7 p.m. it was made out by vaginal examination that the long diameter of the head lay transversely, and that flexion was not good. The sutures and fontanelles were obliterated, and there was considerable riding of the right parietal bone over the left, although the head was not impacted in the pelvis, for the finger could be passed easily behind and around it. As the pains were strong, the os dilated, the fœtal heart-sounds strong, and no pelvic contraction existed, it was decided not to interfere, for a time at least. The pains became stronger, and at last almost continuous. At 9.30 p.m. it was noticed that the head seemed to descend a little with a decided jerk, and that it came into the oblique diameter from the transverse. At 10 p.m. the pains were violent and continuous, and the fœtal heart-sounds could not be made out; no progress had been made since the last examination, and the head did not advance or recede as the pains became more or less severe; in fact, the head seemed to be pressed down and held firmly against the pubes, although the finger could be passed easily around the lateral walls of the pelvis and into the hollow of the sacrum. Evidently the head was not impacted, but simply fixed upon the pubes. During each pain the fundus bulged forward, forming a prominent irregular tumour beneath the ensiform cartilage. As it was obvious that the woman could not deliver herself, and that a continuance of such violent pains without intermission might result in rupture of the uterine wall, it was decided to interfere. The patient was anæsthetized and forceps applied. A slight traction downward and backward brought the head down upon

the perineum, and the blades were removed in three minutes. Some little time was taken in delivering the head, in order that the repaired perineum might not be torn. The cord was not pulsating when it came within reach, and the child was born dead; it weighed 8 pounds. The uterus contracted well, and the placenta came away in half an hour. The placenta was attached high up near the fundus, and as it descended into the lower uterine segment the fundus was felt to spring forward and bend sharply toward the pubes; a strong thick band was felt holding it firmly in that bent position.

The puerperium was uneventful. During the first week the fundus was drawn over markedly to the left side, and the fixation ligament could be felt directed upward and backward from the abdominal wall; but when the uterus became a pelvic organ the ligament was directed downward and backward. The most comfortable position in bed was on the back or on the left side.

In this interesting case (Case 6) there was marked asynclitism, the uterus being bound firmly to the abdominal wall by the fixation ligament, and thereby prevented from driving the head downward into the pelvic cavity in the normal way. The anterior uterine wall could not contract as powerfully as it would have done had there been no fixation ligament, consequently the posterior wall contributed the greater portion of the uterine expelling force. The resultant of the uterine efforts was in a direction downward and forward, instead of in the axis of the brim. Thus, the fœtal head was forced down upon the pubes, the anterior (left) parietal bone was arrested, while the posterior (right) parietal bone glided past the promontory into the cavity. This constituted an exaggerated and persistent Litzmann's obliquity. The uterine expelling force was directed forward against the pubes, consequently the head did not advance; it was *arrested*, not *impacted*. As soon as a backward pull was made with the forceps, the anterior parietal bone glided behind the symphysis, and the head slipped down easily to the floor of the pelvis. What the most violent continuous uterine action had failed to do was accomplished easily in a couple of minutes by one slight pull in the proper direction by means of the forceps.

The following points are worthy of special notice:

Rotation or Inclination of the Uterus to the Left Side.—Whether the uterus was inclined originally to the left by the fixation ligament or not, it is evident that it was firmly held inclined in that direction by the ligament, and prevented from rotating or falling over to the right. This accounts for the pain in the right side when the patient lay on the right side during pregnancy and the first week of the puerperium, also for the drawing of the uterus to the left side until it became once more a pelvic organ.

Great Overlapping of the Parietal Bones.—The faulty direction of the uterine expelling force, driving the left parietal bone (anterior)

against the symphysis, forced it beneath the right parietal (posterior), and the violence and persistency of the pains, with little or no intermission, made this overlapping constant. Great cerebral compression must have been the result, and this was probably a large factor in causing the death of the child.

Situation of the Fixation Ligament as determining the Development of the Uterus in Pregnancy.—In some of the reported cases, the *anterior* wall of the uterus seems to have been prevented from developing by the pull of the fixation ligament; the *posterior* wall, therefore, had to grow and stretch out as the fœtus developed. In such cases the anterior wall has been described as forming a thick fleshy tumour above the pubes, while the thinned-out posterior wall enveloped the fœtus; and the difficulty in delivery arose chiefly from the presenting part being driven back against the promontory. In this case, however, the anterior wall grew, and took its share in the formation of the fully developed uterus, as is proved by the fact that the anterior and posterior walls involuted together, and the tubes, ovaries, and uterus retained their normal relations to one another during the puerperium.

From the study of this case, it seems to be of prime importance that, in performing ventrofixation, the fixation-point be made as low down as possible on the fundus, and in the middle line, in order that the development of the uterus in pregnancy be not interfered with, and that the expelling power of the uterus be not impaired.

With regard to the management of pregnancy in a woman upon whom this operation has been performed, it seems advisable to keep her under careful observation, and to be prepared to induce labour before full time if urgent symptoms should arise. If I had to manage another pregnancy in this patient, I should feel inclined in the interests of the child to induce labour at the end of the eighth month, when the head would be smaller, softer, and more easily moulded.

In the management of labour, too much should not be expected of the uterus which is so heavily handicapped, and the early use of forceps would seem to be the wisest course.

CASE OF VAGINAL CYST PROCIDENT FROM THE VULVA.

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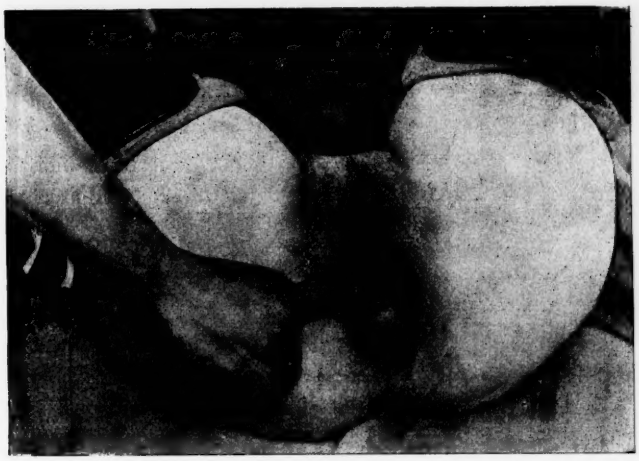
In this case there was present the very unusual condition of a cyst growing in the posterior vaginal wall and procident from the vulva. As a good photograph was obtained, its reproduction here may interest the readers of the new journal.

M. N., aged twenty-two, married two years, a primipara, was admitted into the Leeds Infirmary January 28, 1901, at the request



Vaginal Cyst procident from Vulva.

of Mr. L. A. Johnson of Normanton. She had given birth at the seventh or eighth month to a stillborn child a month previously. On admission she complained that when she walked a tumour projected about a finger's length from the vulva, which impeded walking and made sitting difficult. The tumour was first noticed on rising from bed after her confinement. It had caused no difficulty in the labour. On vaginal examination in the semi-prone position nothing protruded externally, and there was a good perineum; but a cyst could be felt in the perineal body, and could easily be everted by the finger. It then presented the appearance of a broadly

pedunculated tumour springing from the posterior vaginal wall. It was spherical in shape, about 2 inches in diameter. It was not tender, and there was no rectocele.

On February 15 the patient was anæsthetized and placed in the lithotomy position, and the accompanying photograph was taken by one of my dressers, Mr. Taylor. I then dissected out the cyst. It contained clear fluid which escaped during the process. The redundant mucous membrane was trimmed off, and the cavity was packed and left to granulate.

On microscopic section the cyst wall showed a fibrous structure with an epithelial lining.

The relation of pregnancy to the appearance of the cyst probably was that the cyst increased in size during pregnancy, and became procident on account of the dilatation of the vagina in parturition. A case somewhat similar to this is figured in Kelly's 'Operative Gynæcology,' vol. i., p. 252. A good discussion on the genesis of vaginal cysts is given in Veit's 'Handbuch der Gynäkologie,' i., p. 252.

AN EXPERIMENTAL STUDY OF THE PELVIC CHANGES PRODUCED BY SEPARATION OF THE PUBIC BONES IN SYMPHYSIOTOMY.*

By ALFRED C. SANDSTEIN, M.D.,

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The following paper is condensed from a portion of my thesis presented for the degree of Doctor of Medicine of the Edinburgh University, and is based upon experiments performed on twenty-eight female cadavera taken at random in the post-mortem theatre. Many columns of figures necessary in a graduation thesis have been omitted from this paper, and I have limited the tabular statements to such as were absolutely necessary for the elucidation of my meaning or for the confirmation of my statements.

The experiments consisted in measurement of the diameters of the false pelvis and of the brim of the true pelvis, of the vertical height of the sacral promontory, and of the interspinous diameter above the upper margin of the pubic symphysis, first of all in the natural state, and then after division of the symphysis and separation of the pubic bones.

The body had already been incised in the middle line down to the mons veneris for the purposes of the autopsy. I therefore merely separated the tissues from the pubes and iliac crests, and cleared the sacro-iliac joints, and marked the extremities of all those diameters whose terminations were not indicated by definite bony landmarks, with small saw-cuts. The vertical height of the sacral promontory was estimated by means of a plumb-rule and a millimetre measure set at right angles to it. With regard to the interspinous diameter, I measured the shortest distance between a ruler placed on the anterior superior spines and the upper edge of the symphysis, although in several cases I estimated the exact vertical height at which this diameter stood above the same point. The object of these last measurements will appear in the course of the paper.

Having made these measurements, and a catheter having been introduced into the bladder to empty it and to define the urinary organs, the symphysis pubis was divided from above downwards, and the separation of the pubes carried out by increments of

* Read before the Edinburgh Obstetrical Society on January 8, 1902.

1 centimetre, from 1 up to 8 centimetres. To do this I had blocks of ebony, of thickness varying from 1 to 8 centimetres, made, and these were in succession introduced between the separated pubes. The measurements were, so far as time allowed, repeated after each increment of 1 centimetre. Professor Simpson very kindly lent me Prochownik's callipers for making the measurements.

At first sight it would seem unnecessary to open a paper on the operation of symphysiotomy with a discussion of the movements of the innominate bones during the separation of the pubes. Superficially, it would seem as if the words 'during the separation of the pubes' contained a sufficient description of all the movements that take place, and that rotation of the innominate bones so as to carry the pubes directly outwards was all that occurred.

The general conception of symphysiotomy is that of an operation whose design is to increase the true conjugate by section of the pubic symphysis, thus permitting such separation of the pubes outwards; but this is based on insufficient study of the anatomical relations and shape of the bony elements concerned. I also hope to show that the true significance of the pubic section in symphysiotomy is not that it will permit separation of the pubes directly outwards, but rather that it will remove an actual barrier or limitation to a movement present in the pelvic girdle before any section of the symphysis pubis is carried out at all, and that it allows a third movement to occur, which could not otherwise take place.

The movements that occur during, and increase with, the separation of the pubes after symphysiotomy are:

1. Movement of the pubes outwards by rotation of the innominate bones on vertical axes passing through their respective sacro-iliac joints.

This movement I describe, for reasons which will be apparent later, as unnatural and forced, and a little reflection will easily show that it is of very little use. For the present it will serve merely to point out that the shape of the pelvic inlet is elliptical, and that the pubes, rotating transversely outwards on the sacro-iliac joints as centres for their movement, sweep on the circumference of a circle, on or near whose most anterior point (with relation to the sacral promontory) they are already situated. Consequently the outward rotation can only increase the sacro-pubic diameter to a limited amount; for although each pubis is carried further from the sacral promontory than it was before, by every access of pubic separation, yet it is not so with the line joining the two pubes, which, indeed,

in some shapes of pelves may even be carried nearer the sacral promontory.

2. The second movement consists in rotation of the innominate bones on a horizontal transverse axis passing through the sacrum, and carries the pubes downwards. This movement was first indicated by Wehle, who, having attached weights to the pubes of a pelvis excised from the body, divided the symphysis. He could, however, only ascribe an increase of the oblique diameters to it. This is not at all its significance.

Dimante (*Répertoire Univ. d'Obst. et de Gyn.*, 1894) states that when the pubic bones in the cadaver are pressed apart the sacrum rotates on its transverse axis, so that the promontory swings backwards and its apex forwards. He could only see in this 'an objection to symphysiotomy on mechanical grounds,' the antero-posterior diameter being diminished more and more from above downwards.

In my cases I obtained proof of the existence of this movement by measuring the exact vertical height of the centre of the sacral promontory above the upper end of the symphysis pubis, and comparing it with the vertical height of the same point above the line joining the upper end, of the separated pubes after each increment of pubic separation. This was done by means of a plumb-rule and a measure set at right angles to it stationed on the centre of the sacral promontory.

I give below a table of the cases:

No. of Cases.	With Pubic separation of	Increase of Vertical Height of Sacral Promontory.	
		Mean.	Average.
10	1 centimetre	2·5 millimetres	3·2 millimetres
11	2 centimetres	5·0 „	5·2 „
10	3 „	6·5 „	7·6 „
10	4 „	7·5 „	8·85 „
7	5 „	9·0 „	9·2 „
3	6 „	13·0 „	13·0 „
6	7 „	7·5 „	9·6 „
8	8 „	9·5 „	8·6 „

In twenty-three cases the mean increase of height of the sacral promontory above the symphysis pubis for each centimetre of pubic separation was 1·4 millimetres (the average increase 1·64 millimetres). Thus, with a pubic separation of 6 centimetres the amount of depression of the symphysis pubis below its original horizontal level would be 8·4 millimetres (or, calculating from the average, nearly 1 centimetre). This, therefore, is proof of the existence of such a move-

ment of the innominate bones, and we may at least calculate on a depression of the pubes of 1·4 millimetres for each centimetre of pubic separation.

There are certain facts, however, that corroborate this downward movement. The lateral margin of the base of the sacrum (at the upper edge of the auricular area), although at first flush with the corresponding border of the innominate bone, with each increase of pubic separation projects more and more above the level of the innominate, so that the salient angle of the sacral auricular area becomes elevated above that of the os innominatum.

In cases where I excised the sacro-iliac joint *in toto*, after a pubic separation of 6 to 8 centimetres, I found that while outward separation of the surfaces had been limited, and was still very difficult, the

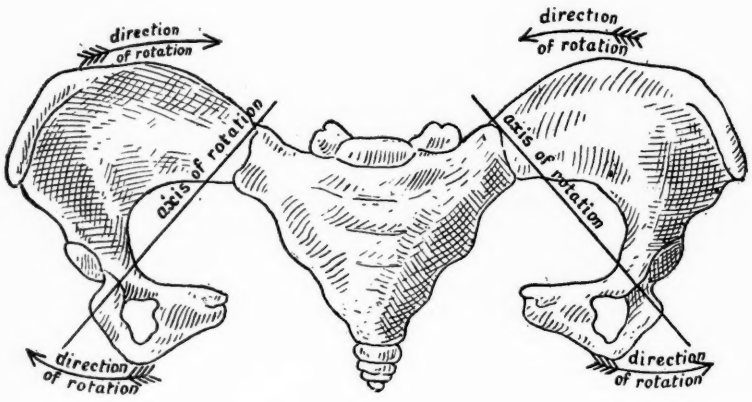

FIG. 1.

iliac part could be easily rotated on the sacral, giving the posterior ligament a slightly spiral twist downwards.

3. Besides these two movements of rotation of the os innominatum on vertical and transverse axes respectively, passing through the sacro-iliac joint, so as to carry the pubes both downwards as well as outwards, a third and hitherto undescribed movement occurs. This consists in rotation of the innominate bone on its own long axis (an axis lying in a direction from the posterior superior spine to the iliopectineal eminence), so as to cause the ilium to become more erect (or vertical). That is to say, as the pubes pass downwards and outwards, the tubera ischii, relatively to the rest of the bone, are carried further apart, while the iliac crests, relatively to the rest of the bone, approximate to one another. The innominate bone, as it were,

revolves on its own axis, the upper part moving inwards towards the middle line, the lower part revolving outwards (Fig. 1).

In eighteen of my cases I ascertained the existence of this movement by placing a ruler against the anterior superior spines and simply measuring the shortest distance between this and the upper end of the symphysis pubis. In every case, with each increment of pubic separation the distance between the interspinous diameter and the horizontal level of the symphysis pubis increased. In five cases I took the vertical height of this diameter above the symphysis pubis by using the plumb-rule, as in the case of the sacral promontory. This measurement also increased with the amount of pubic separation.

From this it is an obvious deduction that, as the pubic bones are separated, the innominate bones rotate on their long axes, so as to

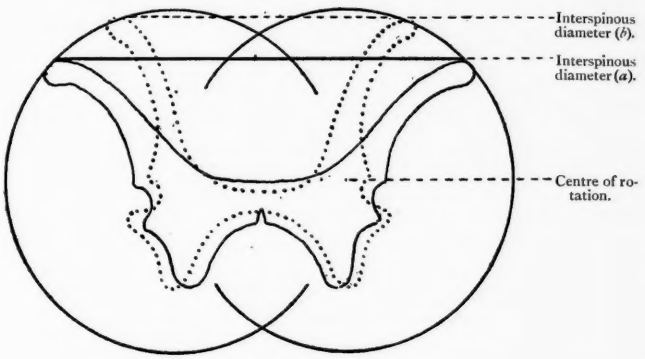

FIG. 2.

carry the iliac crests more inwards towards the middle line. For the distance between the anterior superior spine and the pubic spine of the same side is a fixed quantity, and cannot alter however much you disturb the relation of one pubic spine to its opposite fellow. Thus it comes about that, leaving separation of the pubes from one another aside, and supposing the pubes to remain in contact, the interspinous diameter could only increase its distance from the pubes by each innominate bone rotating on an axis between the sacro-iliac joint of its own side and some point on it anterior to that, so that the iliac crests would move on the circumference of a circle whose centre was on that axis, and would pass inward towards one another and at the same time upwards to the highest point on the circumference of that circle (Fig. 2).

This movement, of itself, would involve a shortening of the inter-

spinous and intercristal diameters, were it not that any such shortening is more than compensated by, and lost in, the increase brought about by the outward movement of the bones after pubic section.

That this increase of the distance of the interspinous diameter from the pubic bones is not due to the outward rotation of the bones placing the line joining the pubes more anterior to that joining the anterior superior spines than hitherto, is proved by the fact that the vertical height of the interspinous diameter also (not merely the distance from the pubes), as I have just stated, increases with the amount of pubic separation. In five cases this vertical measurement increased by an average of 1·5, 3·5, 2·0, 4·0, and 1·3 millimetres respectively per centimetre of pubic separation. The mean of these averages is 2 millimetres (the average 2·4 milli-

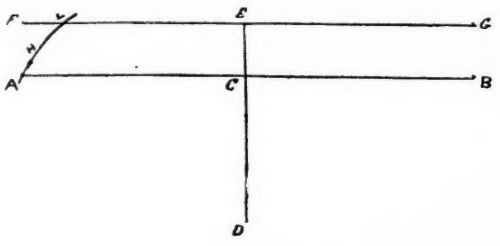

FIG. 3.

AB=mean length of interspinous diameter, and represents that diameter; *CD*=mean vertical height of interspinous diameter, and *D* represents the symphysis (upper end); *CE*=mean increase of vertical height of interspinous diameter; *FG*=interspinous diameter in its new position after the rotation; *AHL*=arc of circle with centre *D*, cutting *FG* at *L*.

metres). Thus with 6 centimetres of pubic separation the average increase in vertical height of the interspinous diameter above the level of the pubes will be 1·2 centimetres, or $\frac{1}{2}$ an inch. The amount of rotation in these five cases was sufficient to move each anterior superior spine along the circumference of a circle for the distance of $\frac{7}{10}$ inch on an average. This result I arrived at by constructing the following figure from the preceding five cases (Fig. 3).

Having proved that the second and third movements exist, I shall endeavour to show that they are entirely in accordance with the natural structure of the pelvis; that the former exists before symphysiotomy, and that the latter is the result of the operation, its effect being merely to extend the former by producing a further dipping of the pubes.

The sacro-iliac joint, composed of articulating sacral and iliac

surfaces, is not a synchondrosis, but is capable of slight movement. Zaglas, Wood, and Matthews Duncan all admit this. Matthews Duncan, in his 'Researches in Obstetrics,' describes a precisely similar movement to my second movement, 'consisting in the elevation and depression of the symphysis pubis, the ilia moving on the sacrum. . . . By the elevation of the symphysis pubis the angle of inclination of the pelvis is lessened, and the conjugate diameter of the brim of the pelvis is diminished to the extent of one or two lines.'

Lenoir found that in females between eighteen and thirty-five years the joints had a simple sliding motion. Cazeau says that the very limited sliding movement of the sacro-iliac joint represents a considerable dip of the pubes.

These authorities thus allow the existence of the second movement in the undivided pelvis, but others prove not only that it exists, but that it increases the true conjugate. Walcher experimented on the pelvis of an eclamptic woman, and found that the extremes of elevation and depression of the pubes when the thighs were bent on the abdomen, and then allowed to hang down, gave an increase of the true conjugate of 8 millimetres. This occurs through the action of the mechanism described by Duncan.

Klein* confirmed Walcher's result, and stated its occurrence at all ages, in both sexes, and in all forms of pelves. It is more marked in contracted pelves.

Pinzani,† Korsch,‡ Balandin, Lebedeff and Bartoszewicz,§ Bonnaire and Bué, Pestalozza and others, confirm Walcher's statement. Further movement at the sacro-iliac joint occurs in cases of anchylosis of the hip-joint. But the most convincing proof is found in the natural construction of the sacro-iliac joints. The articulating surfaces consist each of an antero-inferior and a postero-superior part, the antero-inferior part being the auricular area covered by cartilage of the same contour, firmly adherent to it.

The joints formed by these surfaces favour downward movement of the pubes in two ways: (1) By their ligamentous construction, for the superior and anterior sacro-iliac ligaments, thin and feeble, cover in the joint above and in front. The posterior ligament, including the oblique ligament, binds the bones firmly together posteriorly, and is aided by the greater and lesser sacro-sciatic ligaments. Thus, these ligaments bind the bones strongly together behind, and form, as it were, a fulcrum and centre for movement,

* *Zeitsch. für Geburts. und Gynäk.*, 1891.
† *Ann. de Gyn.*, 1899.
‡ *Zeitsch. für Geburts. und Gynäk.*, 1881.
§ *Ann. de Gyn.*, 1899.

while in front they are thin and feeble. Below, also, the sacro-sciatic ligaments would be tightened by any attempt at upward rotation at the sacro-iliac joint, unless as a recovery of a former position after they have been relaxed by downward rotation at the sacro-iliac joint. So that the construction of the sacro-iliac joint not only favours downward movement of the pubes, but compels it to combine with the outward movement.

(2) By the conformation of their articular surfaces, and of the sacrum as a whole. For a projection on the salient angle of the sacral auricular area fits over a bevelled-off area on the salient iliac auricular angle, and that iliac bevel ending below in a raised edge causes the sacrum 'to bite on the ilium here to a considerable extent, forming what is called in engineering nomenclature a joggle to the sacral "voussoir."' This prevents rotation of the ilium upwards. There is also a similar bevelled-off area on the posterior end of the horizontal limb of the iliac auricular area, covered by a projection at the corresponding point on the sacrum.

In addition a distinct elevation, sometimes an elongated rounded ridge, extending along the iliac auricular area, and following its curve, fits into a more or less well-developed elongated depression running along the sacral auricular area, and forming the arc of a circle whose centre is at a point coincident with that on which downward movement of the innominate bone on the sacrum occurs —namely, at the centre of action of the posterior sacro-iliac ligaments.

Thus, as it were, a groove and slot arrangement is provided on the joint surfaces for rotation downwards, with a circular sweep of the innominate bone on the sacrum, and a joggle is provided at the salient auricular angles to check upward movement of the innominate bone, except so far as is necessary to recover its former position.

Again, the sacrum itself is wedge-shaped when looked at from three directions: (1) From the anterior aspect, with the base of the wedge at the promontory; (2) from above, with the base of the wedge at the anterior margin, and the apex towards the posterior margin, the sacrum being broader in front than behind, because of the salient auricular angle projecting as described, and because of the hollow posteriorly necessary to lodge the interosseous ligaments; and (3) looked at from the side, with the base of the wedge above.

As a result, the auricular area of the sacrum looks outwards, downwards, and backwards, overhanging the iliac area, which faces

in the opposite direction, and so preventing its movement upwards, and the sacrum, narrower behind and below, fits into an interval between the auricular areas of the ilia, which is narrower behind than in front.

From the preceding, it is evident that movement of the pubes downwards can, and does, occur, as Walcher described. But it is limited, because the interval between the iliac surfaces is narrower posteriorly. Then, when we superadd pubic section, at once the range of the pubic descent is altered. For the uterine efforts are directing an expanding or outward, and a downward force on the brim, which can only take effect on the movable segment, the innominate bones rotating downwards at the sacro-iliac joints. When the symphysis is intact this movement must be limited, because the sacrum, being wider in front than behind, after a certain amount of pubic depression, the check is at once applied by the upper portion of the two iliac auricular areas coming in contact with the wider anterior portion of the sacral body. This is a consequence of the wedge-shape of the sacrum, and the corresponding shape of the interval between the two iliac articular areas into which it fits.

But divide the symphysis pubis, and at once the knot is cut which ties the bones together, and thus keeps intact the mechanism which checks the downward movement of the pubes. The parturient powers continue their downward and expanding action, and as a consequence the pubic bones separate from one another. But the distending action of the relatively small fœtal skull, acting anteriorly to the sacro-iliac joints, the effect is exaggerated at the pubic end and drives the pubes far apart. Thus is removed all bar to further pubic descent. In this way my contention is borne out that the first or outward movement of the pubes is unnatural, and is necessary merely for the descent of the pubes; while one scarcely wonders, as I shall show, that it adds little, as a rule, to the true conjugate.

While these movements—separation and descent of the pubes—are going on, the third movement has had its inception from the very moment of the pubic section. For the iliac crests follow the movements of the pubes, but in a diminishing degree as we pass backwards along them. Also the iliac crests are fixed to the rest of the frame by wide and strong muscular and ligamentous attachments; on the other hand, the ischia and pubes have no such attachments, all the muscles and ligaments attached to them, except along the upper margin of the pubes, being greatly slackened by the descent of the bones. Therefore there are two forces

acting on the innominate bones: (1) the ligaments and muscles pulling on the iliac crests upwards and inwards; (2) the parturient powers acting on the bones downwards and outwards at the ischia and pubes. The resultant is a movement of the innominate bone on its long axis, so that the ilium, being more detained than the rest of the bone, moves less and becomes more erect with relation to the ischia and pubes and the vertical line.

The effect of this third movement is to increase the descent of the pubes; for just as the point of a hook, when the handle is rotated on its long axis, will dip, so the pubes, when the innominate bones are rotated in the manner just described, will dip.

Before proceeding further I shall give a short outline of the effect of the separation of the pubes in increasing the diameter of the false pelvis and brim of the true pelvis.

The conjugata vera averaged 11·28 centimetres, or 4·4 inches, and the average increase was 1·67 millimetres per centimetre of pubic separation. I give a table below:

Pubic Separation.	Increase in Conjugata Vera.
1 centimetre, or ·39 inch	1·67 millimetres, or ·065 inch
2 centimetres, or ·78 „	3·34 „ or ·13 „
3 „ or 1·17 inches	5·01 „ or ·195 „
4 „ or 1·56 „	6·68 „ or ·26 „
5 „ or 1·95 „	8·35 „ or ·325 „
6 „ or 2·34 „	10·02 „ or ·39 „
7 „ or 2·73 „	11·69 „ or ·455 „
8 „ or 3·12 „	13·36 „ or ·520 „

Roughly speaking, 6 centimetres of pubic separation give an increase of 1 centimetre. I may state in passing that if they are grouped according to the length of their conjugatæ veræ, in the pelves I examined, the longer the true conjugate the greater the increase for each centimetre of separation.

I must also note that no greater gain can be hoped for than that I have stated above by such incidents as a bulging of the fœtal head between the bones. Such an occurrence is not only impossible further than the natural convexity of the fœtal skull will produce, but would, if it occurred, be extremely dangerous to the structures most of all endangered in this operation. The fœtal skull can compact itself and adapt its outline to that of the brim. Where the brim is divided, it merely bridges across the gap, and maps out, as it were, the original line of the separated pubes.

The diagonal conjugate increased nearly 2 millimetres (1·8 milli-

metres) on an average per centimetre of pubic separation, the intertrochanteric over 6 millimetres, the intercristal 2·4 millimetres, and the interspinous 5·61 millimetres per centimetre of pubic separation. The transverse diameter of the brim increased 4 millimetres, and the right and left oblique diameters of the brim 3·84 and 3·9 millimetres respectively per centimetre of pubic separation.

An examination of these results shows that the diameters lying more or less transversely are increased greatly by each centimetre of pubic separation, and a very small amount of pubic separation will enlarge these sufficiently to let the fœtal head pass. But, unfortunately, it is more usually the true conjugate that presents the difficulty, and 6 centimetres of pubic separation enlarge that, on an average, only about 1 centimetre, or $\frac{2}{5}$ inch.

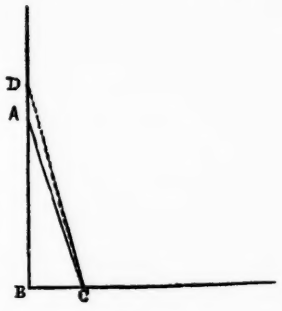

FIG. 4.

The question now arises, To which of these movements of the innominate bones are we to ascribe the benefit of the operation? Hitherto it has always been ascribed to the outward movement.

Now, the total average amount of increase that we are entitled to look for by a pubic separation of 6 centimetres is 1 centimetre, or $\frac{2}{5}$ inch. This access of length can be divided into two portions: (1) that due to the descent of the pubes or relative elevation of the sacral promontory, and (2) that due to outward movement of the pubes. The third movement of rotation on a long axis merely increases the descent of the pubes, and therefore its value is included with that of the second movement.

By constructing a right-angled triangle ABC (Fig. 4) for each pelvis whose hypotenuse AC is equal to the true conjugate, and the perpendicular to the base AB is equal to the vertical height of the sacral promontory above the symphysis pubis, we get a fixed base

BC. If, now, we reconstruct the triangle on the same base BC, but with the vertical height of the sacral promontory increased by the amount gained by 6 centimetres of pubic separation AD, the hypotenuse DC of this second triangle is equal to what the true conjugate would be were it increased only by descent of the pubes.

In my cases the conjugata vera averaged 11·28 centimetres, and the vertical height of the sacral promontory 10·24 centimetres. The increase of vertical height of the sacral promontory averaged 9·84 millimetres per 6 centimetres of pubic separation. Calculating as above, this amount of relative depression of the pubes would increase the true conjugate by 9·6 millimetres. But the total average increase for 6 centimetres of pubic separation, with all the movements counted in, is 10·02 millimetres.

Thus, by subtracting 9·6 millimetres from 10·02 millimetres, we get only 0·42 millimetre left to be accounted for by the outward movement of the pubes. So that the first movement increased the true conjugate by $\frac{1}{2}$ millimetre, the second and third by nearly 1 centimetre.

An examination of each individual case gives the following result:

Amount of Pubic Separation.	Total Increase.	Increase from Outward Movement.	Increase from Downward Movement.
7 centimetres	1·9 centimetres	0 millimetre	1·9 centimetres
4 „	1·0 „	1 „	0·9 „
3 „	·6 „	0 „	6 millimetres
5 „	1·0 „	4 millimetres	6 „
5 „	1·4 „	8 „	6 „
5 „	1·5 „	7 „	8 „
5 „	·5 „	? „	11 „
3 „	·5 „	? „	7 „
4 „	·8 „	2 „	6 „
7 „	1·5 „	10 „	5 „
7 „	·6 „	? „	11 „
8 „	·5 „	0 „	5 „
8 „	1·3 „	4 „	9 „
8 „	1·5 „	11 „	4 „
8 „	1·7 „	5 „	12 „
8 „	1·15 „	5·5 „	6 „
8 „	1·0 „	6 „	4 „
7 „	·8 „	3 „	5 „
8 „	·8 „	·5 „	7·5 „
8 „	1·3 „	8 „	5 „
7 „	·8 „	? „	13 „
6 „	1·0 „	? „	13 „
7 „	·9 „	2 „	7 „

In five cases outward movement accounted for most of the increase.

Total Average Amount of Increase per 6 centimetres of Pubic Separation.	Proportion of Total Increase due to	
	Outward Movement.	Descent of Pubes.
1·8 centimetres	4 parts (1 centimetre)	3 parts (·8 centimetre)
1·2 „	2 „ (·8 „)	1 part (·4 „)
1·2 „	11 „ (.88 „)	4 parts (·32 „)
·9 „	3 „ (·54 „)	2 „ (·36 „)
·8 „	5 „ (·5 „)	3 „ (·3 „)

In ten cases descent of the pubes accounted for most of the increase.

Total Average Amount of Increase per 6 centimetres of Pubic Separation.	Proportion of Total Increase due to	
	Outward Movement.	Descent of Pubes.
1·5 centimetres	1 part (·15 centimetre)	9 parts (1·35 centimetres)
1·2 „	2 parts (·48 „)	3 „ (·72 „)
1·8 „	7 „ (·84 „)	8 „ (·96 „)
1·2 „	1 „ (·3 „)	3 „ (·9 „)
·96 „	4 „ (·3 „)	9 „ (·66 „)
1·2 „	5 „ (·34 „)	12 „ (·86 „)
·84 „	5½ „ (·34 „)	6 „ (·5 „)
·6 „	3 „ (·23 „)	5 „ (·37 „)
·6 „	½ „ (·03 „)	7½ „ (·57 „)
·6 „	2 „ (·14 „)	7 „ (·46 „)

In three cases the descent of the pubes accounted for all the increase.

In five cases the amount of increase that the true conjugate should theoretically have derived from the pubic descent was greater than that actually derived by the total effect of all three movements. In order to account for these cases, it must be explained that where the shape of the brim is more circular than elliptical, the effect of the outward sweep of the pubes is to carry the interpubic line posterior to the original site of the symphysis pubis, because the pubes were already situated on the most anterior points of the circumferences of the circles they are describing. Thus the outward movement would really detract from, instead of increasing, the conjugata vera. Consequently, in certain cases, with a circular brim, symphysiotomy from the point of view of the outward movement is actually harmful as regards the true conjugate.

We may now state (1) that the outward movement or separation of the pubes (*a*) increases the true conjugate, being more often the minor than the major factor in the increase; (*b*) sometimes actually lessens the true conjugate; (*c*) increases greatly the diameters lying

in a more or less transverse plane. (2) That the downward movement of the pubes, on the other hand, has for its function (*a*) the increase of the true conjugate, being usually the major factor, seldom the minor factor, and sometimes the only factor in its increase; (*b*) increased safety, as this movement is less dangerous than outward separation of the pubes.

From the preceding statements it appears that the true significance of the division of the pubic symphysis during labour in order to increase the true conjugate of the pelvic brim lies mainly in the fact that it thereby permits increased descent of the pubic bones from their previous horizontal level. This would lead to the conclusion that symphysiotomy is really a means of obtaining greater effects than we can by Walcher's position, and we may test this by a rough comparison with the results of Walcher's position.

Lebedeff and Bartoszewicz,* experimenting on twenty-five adult and two infant pelves, obtained an increase of the true conjugate of 3 millimetres; Bonnaire and Bué of 3 to 4 millimetres by Walcher's position. An increase of the true conjugate of 4 millimetres in an average pelvis represents a descent of the pubes of 5 millimetres. Therefore Walcher's position can only depress the pubes to a *maximum* of 5 millimetres, whereas by symphysiotomy with 6 centimetres of pubic separation the *mean* depression of the pubes is 8·4 millimetres.

But if Walcher's position and symphysiotomy are both used, the result is a pubic descent of 5 millimetres (maximum, Walcher) + 8·4 millimetres (mean symphysiotomy). For in his paper 'On the Set of the Pelvis in the Body,' Dr. Barbour,† using my measurements of the vertical height of the sacral promontory, shows that 'the effect of opening the abdomen and detaching the muscles is to increase the angle of the set of the pelvis.' In other words, pubic descent had taken place because of the necessary preliminaries to the research. So that I had started my measurements with the pubes already depressed, as by Walcher's position; and therefore all the pubic descent that my measurements showed was entirely due to the symphysiotomy.

For symphysiotomy to be a successful operation we must choose only suitable cases. To choose suitable cases we must know (1) what gain in the conjugata vera a given amount of separation of the pubes will yield—this I have fixed at an average of 1·67 millimetres per centimetre of pubic separation; (2) what amount of

* *Ann. de Gyn.*, 1899.

† *Trans. Eain. Obstetrical Soc.*, vol. xxv.

separation of the pubes is safe. From these two data we may decide whether the conjugata vera will be sufficiently increased by a safe amount of pubic separation to let the fœtal head pass.

In order to get at the second point, I shall consider, in my twenty-eight cases, each portion of the pelvis separately.

The *sacro-iliac joints* are affected as follows: The movements at the pubes are all reflected in miniature at the sacro-iliac joints, so that the bones are separated from one another anteriorly. The separation is always widest between the salient angles of the auricular areas, and the upper margin of the lateral mass of the sacrum increasingly projects above the corresponding upper border of the iliac articular surface.

The *posterior sacro-iliac ligament* binds the bones together posteriorly, and forms the centre for the downward movement. It always remains intact.

The *anterior and superior sacro-iliac* ligaments suffer most; they are very apt to tear. This tear begins in every case in the superior ligament, just posterior to a line joining the salient angles of the articular surfaces. It may appear elsewhere almost immediately, and when separation of the pubes is continued beyond the amount at which it began to appear, it passes in both directions from that point. The tear starts at this point because of the projection of the auricular area of the sacrum at the salient angle, above the level of the auricular area of the ilium, throwing greater strain on the ligament here.

The amount of separation required to cause rupture varied in the experiments, occurring earliest in nulliparæ, later in parous women, and being very little apt to occur in pregnant or parturient pelves. Reference to my thesis will give details, but here it will suffice to state that in 44 per cent. the rupture began below 6 centimetres of pubic separation, while in 56 per cent. it began at or above that point. In two it began only at 8 centimetres, and in one not even at 8 centimetres. The *tissues in front of the joints* are not greatly strained.

The *mons veneris* in many cases was greatly affected. In spite of the slackening of the tissues by the abdominal incision and by their separation from the innominate bones, the incision was very apt to extend downwards into the mons veneris. After 4 centimetres of pubic separation, a great strain was thrown on it; after 7 centimetres it always tore.

The *vulva* also was greatly affected by the separation of the pubes. In only one case, that of a multipara, did an actual tear

occur; but in every case, as the distance between the pubes increased, so did the stretching of the tissues between them, especially of the vestibule. At and after 7 centimetres of pubic separation the structures between the anterior parts of the labia majora were stretched like a drum between the separated pubes, and were thrown into ribbed folds or corrugations, like those in corrugated iron. With lesser degrees of separation a less damaging condition of affairs existed. Up to 5 or 6 centimetres the strain was borne well; after 7 centimetres it was evident that there would be a great risk of sloughing of the stretched tissues.

The *bladder and urethra* were not affected. The strain, of course, is thrown transversely across the urethra, and not along it. Thus it escapes, unless when a tear occurs.

The *vagina* is only affected at its orifice, as I have described in connection with the vulva.

Having considered the effect of pubic separation on the various parts of the pelvis, I shall consider what amount of pubic separation is safe in each respective part.

Authors give various opinions as regards the sacro-iliac joints. V. Cocq* says that the maximum amount of separation of the pubes with safety to the sacro-iliac joint is 6 centimetres; Pinard says 6 centimetres; Döderlein and Morisani found no lesion of it with 5 centimetres. The dangers have been variously stated as 'suppuration of sacro-iliac joints,' 'caries,' 'and 'non-union.'

My own opinion is that the *danger of pubic separation has no reference at all to the sacro-iliac joints;* that therefore we need not limit the amount of pubic separation if it were not for the sake of other structures; for rupture of the anterior and superior ligaments is of little consequence, and would not delay healing, while the strong posterior ligaments and the strong sacro-sciatic ligaments are never in any danger of rupture, being relaxed, not tightened.

Reference to recorded cases will support this statement. Among over 300 that I collected between 1892 and 1898 no such sequelæ as suppuration or caries or non-union occurred in the sacro-iliac joints. There has been recorded, as in Koffer's case performed March 6, 1893, pain persisting for some time in these joints, but no more.

It is recorded that in cases where the patient died soon after the operation there was rupture of the anterior ligaments; but this, I am sure, would never have been known but for the patient's death so soon after the operation, and from some other cause.

So that I conclude that the danger of pubic separation after

* *Journ. de Méd., de Chirurg., et de Pharm.*, 1893.

symphysiotomy lies not in the sacro-iliac joints, the tissues near the joints, nor *per se* in the bladder, urethra, or vagina, but in the vulva, especially the vestibule; and in the extension of vestibular tears to the adjacent anterior wall of the vaginal orifice with its contained urethra, and to the bladder; and that the maximum amount of pubic separation should not exceed 6 centimetres. But that the danger lies in and around the symphysis pubis is amply confirmed by experience. Thus, of lacerations which occurred in 30 cases, 5 times they were due to extension of the operation-wound, 7 times to tear of vestibule, once to tear of labium minus, 9 times of anterior vaginal wall, 3 times of urethra, none of bladder alone; of vestibule, clitoris and urethra 2, of urethra and vagina 1, of urethra into vagina and bladder 1, of urethra, vagina, cervix, and perineum 1. Most of the other complications and sequelæ are from preventable causes. Thus, in 7 cases the lacerations were not due to the symphysiotomy, but came from the mismanaged labour. Hæmorrhage occurred in 38 cases: from the operation wound 8, from corpora cavernosa clitoridis 9, from vessels of bladder 2, from varicose veins of vulva 1, from venous sources 6, from torn cervix 1, and in the third stage and post-partum 11.

The limitation of pubic separation to a maximum of 6 centimetres is also justified by experience. For over all the cases (170 out of 300) where the amount of pubic separation was recorded, the maximum averaged 5·6 centimetres. In only 6 were the pubes separated over 7 centimetres. These had respectively a separation of 7·5, 8, 8, 9, 10, and 12·5 centimetres. The first two and the last had an uncomplicated recovery. The third (8 centimetres) had a tear of the vestibule, and died of sepsis. The fourth (9 centimetres) recovered, but a crack was heard during the separation, in the sacro-iliac joint. The fifth (10 centimetres) had the urethra ruptured, and died of hæmorrhage from the operation-wound and post-partum.

I am now in a position to state the practical results of my study:

1. Since 6 centimetres of pubic separation is all that we can allow, the utmost amount of increase of the true conjugate we can aim at is 1 centimetre, or $\frac{2}{5}$ inch. Therefore the cases must be strictly limited to those in which, by an addition of $\frac{2}{5}$ inch to the true conjugate, we can *with safety to the mother* deliver a *living* child by nature alone, or aided by forceps or version. Therefore our cases must be limited to such as, with a pubic separation of 6 centimetres as a maximum, will have the length of their true conjugates

raised to $3\frac{1}{4}$ inches at the least. If we subtract $\frac{2}{5}$ inch from $3\frac{1}{4}$ inches, we get $2\frac{7}{8}$ inches, or 7·3 centimetres.

Therefore symphysiotomy should never be performed unless there is a true conjugate of at least $2\frac{7}{8}$ inches. That this is the minimum conjugate is abundantly evident from the literature of the subject; and, finally, Morisani states that there is not much scope for the operation with a conjugata vera below 7 centimetres.

2. The child must be living.

3. Walcher's position must be used, and, as far as possible, maintained, together with support to the sides of the pelvis.

4. It is necessary in some cases to counteract unequal movement on the two sides of the pelvis. Cases have been recorded where one side of the pelvis moved more than the other side. Thus one pubic bone comes to lie on a plane posterior to the other, and forming a relative projection into the brim of the pelvis, the bladder and vagina come to be squeezed between it and the fœtal head, and perforation of the bladder or anterior vaginal wall may result. In many of my cases I noticed this tendency to unequal movement on the two sides of the pelvis. In these cases the block of wood pushed between the pubes used the non-moving side as a fulcrum from which it pushed the other side. Then the anterior and superior sacro-iliac ligaments on the moving side stretched more and more, and very soon yielded.

Thus it appears that once this asymmetrical movement is set up, it very soon causes rupture of ligaments on that side. In addition, as in cases recorded by Harris and Jarman, perforation of the bladder or anterior vaginal wall may result, while the fœtal head is deeply grooved.

In order to arrest this asymmetrical movement, a departure from Walcher's position is necessary. By flexing the thigh of the non-moving side, and abducting the bent-up knee, that side can be made to move equally with the other side, and the rupture of the ligaments can thus be avoided or delayed. In such cases, therefore, this position can be used.

5. The knife used to sever the symphysis should be a broad-bladed one, otherwise there will be difficulty with the division of the symphysis pubis.

6. Division of the subpubic ligament should not be aimed at, although the symphysis must be completely divided. The subpubic ligament offers some resistance to the pubic separation, and if left untorn prevents the extension of the wound down into the vulva, just as the hem of a handkerchief prevents the linen from tearing.

7. Ossification of the cartilage does not occur—at least I never found it, even in subjects as old as seventy years. Wehle also doubts its occurrence from age. And this leads us to the importance of localizing the upper end of the symphysis pubis. For if the joint is missed, not only is there great delay, but also, as Harris states, the detached end of the pubic bone necroses, and a fistula is the result. Indeed, I am persuaded that in those cases where the joint is said to be ossified, it has merely happened that the joint has been missed and the bone severed. Lewers of London (February, 1893) operated on a case, and had recourse to the saw to divide the symphysis. Necrosis occurred as a result. It is not always the case that the joint is in the median line at its upper end. In twenty-four of my cases, 50 per cent. had the upper end in the median line, $33\frac{1}{3}$ per cent. to the left of it, and $16\frac{2}{3}$ per cent. to the right. In sixty cases Wehle found that $13\frac{1}{3}$ per cent. had the joint in the median line, $66\frac{2}{3}$ per cent. to the left, and 20 per cent. to the right of it.

All that one can state is that if the upper end of the symphysis is not in the median line, it is more probably situated to the left than to the right. But it is always quite easy to find the upper end, because there is a fibrous thickening forming a tubercle on its summit, from which a ridge marking the line of the joint passes down the posterior aspect of the symphysis. So that by feeling along the upper edge of the pubic bones for this tubercle one can always find the upper end of the joint.

8. Finally, looking to the number of deaths from sepsis, and to the frequency of localized septic infection, rigid asepsis is necessary for the operator. And since so many fatalities from sepsis occur in patients with a previous foul vaginal discharge, the existence of such foul discharge should be looked upon as a contra-indication to the operation.

CRITICAL REVIEW.

THE OPERATIVE TREATMENT OF PROLAPSE OF THE UTERUS AND VAGINA.

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THE operative treatment of prolapse of the uterus and vagina is a subject which has always excited much interest among gynæcologists. From the time that Marshall Hall introduced surgical treatment for severe forms of procidentia until quite recently, the discussion has been concerned chiefly with the various means of contracting the vagina and strengthening the perineum by plastic operations. Within the last few years the increased familiarity with abdominal section, and the improved technique of vaginal section, has led many operators to attempt to cure prolapse by fixation operations on the uterus. The result of this is that the surgical methods which are recommended, and have been tried in cases of prolapse, form quite a long list. We may enumerate the methods which have been most freely employed as follows:

(1) Plastic operations on the vagina and perineum; (2) vaginal fixation; (3) vaginal shortening of the round ligaments; (4) Alexander's operation; (5) ventrofixation; (6) the operations of Freund and Wertheim; (7) total extirpation of the uterus.

Each of these operations is further subdivided by its various modifications, so that the resulting literature on the subject is voluminous and somewhat confusing.

An attempt has been made by various writers to establish the relative worth of these operations by the publication of lists of cases in which special attention is directed to the local conditions which have been found after a considerable time has elapsed since the operation. The value of these statistical inquiries may seem open to doubt, and in some of the papers there is a good deal of skilful manipulation of figures; but a careful analysis of the results helps to give one a more exact knowledge of the utility of the various methods of surgical treatment than would otherwise be at our disposal.

1. *Plastic operations on the vagina and perineum.* — The most important paper of recent years on the technique of plastic operations for prolapse is one by Sänger[1] which appeared in the *Cent. für Gynäk.* of 1898. He holds that the fundamental point for the success of operations for prolapse still lies in plastic methods. He believes with Hegar that the insufficiency of the mechanism for closing the genital canal plays a greater part in the etiology of prolapse than the primary insufficiency of the peritoneal attachments. He points out that much depends on the individual operator, and that to perform plastic operations is still an art that many surgeons, who are otherwise skilful, do not practise. He lays stress on the great importance of preparatory treatment by rest in bed, replacement of the prolapse, douching, etc., and calls attention to the astonishing changes which occur in the most pronounced form of prolapse after this treatment. He then gives an account of the method which he adopts in operating. His first step, as a rule, is the preliminary high amputation of the cervix. When this has been done, and is followed by the vaginal plastic operation, the os uteri lies high up. At a later stage the cicatricial contractions which occur between the cervix and vaginal walls produce a sort of internal fixation of the uterus. The next step is to produce a raw surface on the anterior vaginal wall, and to bring its edges together by sutures. The same thing is done on the posterior vaginal wall, and the perineum is then brought forward and strengthened by a plastic operation on its vaginal aspect. The method of obtaining the raw surface on both anterior and posterior vaginal walls consists in making a mesial longitudinal incision, and raising two side-flaps by dissecting outwards from this mesial incision. No speculum is used, but the incision and separation of the flaps is facilitated on the posterior wall by catching hold of the mucous membrane with pressure forceps placed step by step from below upwards. In this way the raw surface may be carried right up to the posterior fornix. The bladder and rectum are restored to their proper positions by stitches in the connective tissue. In all cases, both for slight prolapse as well as the more severe forms, a thorough colpoperineorrhaphy must always be performed after the completion of the anterior colporrhaphy. The omission of this precaution is often alone to be blamed for the recurrence of a cystocele.

Sänger is not in a position to give the ultimate results of his operation in figures and percentages, but he affirms confidently that he has seen very few cases of recurrence in the large number of prolapse operations which he has performed, and that in no case was

the recurrence as well marked as the original trouble. The majority of so-called recurrences are cases in which either the operation or the healing has been imperfect.

Sänger's method of operating does not differ in essential particulars (except, perhaps, in the preliminary high amputation of the cervix) from the methods which were previously practised by Simon, Hegar, and Bischoff. The vaginal plastic operation has also been frequently performed in France and in America. Le Fort's method, which consists in denuding both vaginal walls in the middle line and uniting the two raw surfaces, has been popular in France. This operation is similar to that performed by Neugebauer in Germany.

In America Marion Sims appears to have been the first to practise anterior colporrhaphy as a routine treatment, and was followed by Emmett and numerous other operators.

In Great Britain plastic operations on the vagina are no doubt frequently performed, but comparatively little information is to be found concerning them in British medical literature. This is the more surprising when we consider that the first anterior colporrhaphy was performed by Marshall Hall, and that good work in plastic operations was done forty or fifty years ago by Baker Brown.

If we return now to recent German literature on the subject of the permanent results of vaginal operation, we may notice the statistics of v. Herff,[2] which are drawn from the results in the Halle clinic. Out of 283 cases, he was able to follow up 252, or 93 per cent. The operations performed for prolapse were anterior colporrhaphy and colpoperineorrhaphy. Often, in addition, amputation of the cervix and vaginal or vesical fixation were performed. A relative cure was observed after the purely plastic operation in 77 per cent.

Theilhaber[3] reports that he has operated by plastic methods on twenty-four patients with well-marked prolapse. Of these he was able to follow up fourteen, and on examining them at a later date he found that thirteen were completely cured and free from trouble; in one case the vaginal portion of the cervix was strongly hypertrophied and presented at the vulva. Of the other ten patients, five wrote to say that they were quite well. Theilhaber's views and methods differ considerably from those of other operators. He believes that a sharp division should be drawn between prolapse of the uterus and prolapse of the vagina. As a rule, the serious prolapses are those of the anterior vaginal wall, with secondary elongation of the cervix. Primary pro-

lapse of the posterior vaginal wall rarely attains a large size, and primary prolapse of the uterus is very rare. The vaginal walls are only fixed by the connective tissue beneath them, and vaginal prolapse occurs as the result of atrophy of this tissue. Tears of the recto-vaginal septum have no real significance for the occurrence of prolapse of the anterior vaginal wall. It follows, therefore, that in operations for prolapse of the anterior vaginal wall the strengthening of the recto-vaginal septum is not necessary. On the other hand, the anterior colporrhaphy should be performed in the most complete manner. The whole of the prolapsed mucous membrane of the anterior vaginal wall should be excised.

Andersch[4] gives the later results from Pfannenstiel's clinic in Breslau, with an analysis of 344 cases. The operative treatment was not limited to the vaginal plastic method, but eighty-three cases are given in which it was alone employed. Of these eighty-three cases, sixty were examined at a later date. The physical conditions were found to be good in fifty, there was slight prolapse of the vagina in seven, and well-marked prolapse in three (83 per cent. 'absolute' and 95 per cent. 'relative' cure).

In passing to the other operations for prolapse, we may note that none of them are complete in themselves, but are invariably recommended by operators of large experience to be used in conjunction with plastic operations on the vagina. Many operators hoped by means of a fixation operation (vaginal fixation, ventrofixation, and Alexander's operation) to be able to dispense with colporrhaphy, but these anticipations were not realized, and nearly all employ the combination of the two methods. The operations of Freund and Wertheim necessitate a raw surface being made, either upon the anterior or posterior vaginal wall, or on both (Fritsch); and advocates of total extirpation of the uterus in cases of prolapse admit that an essential point in the success of the operation is that it should be combined with a plastic operation on the vagina.

2. *Vaginal fixation.*—Some of the various fixation operations for prolapse may have been originally undertaken with the idea of supporting the uterus only from above, but experience soon showed —as, indeed, might have been expected—that the adhesions produced by Alexander's operation or by ventrofixation were not in themselves strong enough to bear the weight thrown upon them in cases of extreme prolapse. But the object of any vaginal fixation could hardly be to obtain a direct pulling up of the uterus, since that organ was fixed by the operation to structures (vaginal wall or peritoneum of utero-vesical pouch) which were specially liable to be

involved in the prolapse. Many surgeons, therefore, who practise this operation explain the success which they claim has followed it, on the ground that the uterus is less apt to become prolapsed when it is fixed in a position of anteversion. They insist that retroversion is the first stage of prolapse, and that if a plastic operation is performed on the vagina, and the uterus is left in a retroverted position, it acts as a wedge in the axis of the narrow vagina, and in this way tends to stretch the cicatrices. On the other hand, when the uterus is anteverted, it forms a more acute angle with the vagina, and the intraperitoneal pressure pushes it down in such a way that the strain is not so much upon the levator ani and perineum as on the ligaments of the uterus (Hohl, Christiani). Those who hold these opinions believe that by preliminary fixation of the uterus in a position of anteversion the results of the vaginal plastic operation are improved. It will be seen that the view here stated differs from that which has been generally accepted: retroversion of the uterus is regarded as a cause rather than as a result of prolapse.

Hohl[5] gives the results of sixty vaginal fixations of the uterus from the Halle clinic. Of these operations, forty-three were undertaken for prolapse in various degrees, and thirty-nine patients were examined at a later date. Slight sinking of the vaginal wall was found in five cases, and complete recurrence of the prolapse in four cases. He believes that after longer observation scarcely 80 per cent. of relative or absolute cure would be found. He concludes that vaginal fixation combined with the vaginal plastic operation is sufficient for the cure of the less pronounced cases of prolapse accompanied by retroversion, but advises that in the more severe forms of prolapse ventrofixation should take the place of vaginal fixation.

Kauffmann[6] communicates the results in fifty-one cases which were followed up out of 103 operations in the University clinic of Berlin. He does not make a very clear distinction between operations undertaken for simple retroversion and those undertaken for prolapse, but he concludes that the results convey the lesson that for marked prolapse, and total prolapse vaginal fixation is not suited.

Schmit[7] reports the results from Schauta's clinic as twenty-two cases with five failures (22 per cent.).

Andersch is a stanch advocate of vaginal fixation, and recommends it for all cases of prolapse where pessary treatment is not possible. He tabulates eighty-seven cases which were examined at considerable intervals after operation. Prolapse of the uterus was

found in two of these, in three others there was prolapse, and in four slight sinking of the anterior or posterior vaginal wall (89 per cent. 'absolute' cure, 94 per cent. 'relative' cure). These results, it will be noted, are only slightly better than the results of the vaginal plastic operation alone which Andersch reports from the same clinic (83 per cent. 'absolute' cure, 95 per cent. 'relative' cure).

I have not thought it of sufficient importance to discriminate between cases which were operated on by the original method of vaginal fixation (fixation of the uterus to the vaginal wall and cellular tissue) and those in which the later modifications of seroso-serous fixation (Dührssen) or vesico-fixation (Mackenrodt) have been followed. The modifications were introduced in the hope of preventing the serious complications of pregnancy and labour which sometimes resulted from vaginal fixation, but they are not of importance in connection with the present subject. The complications of labour which are produced by operations for prolapse will be considered further on.

3. *Shortening of the round ligaments through the vagina.*—This operation was an outcome of vaginal fixation, and was introduced in the hope that it would be equally effective in the cure of retro-displacements of the uterus, and at the same time would be safer from the point of view of future pregnancy. Two methods have been adopted. In the one the round ligaments are stitched into the wound in the anterior fornix of the vagina; in the other they are pulled down into the vagina and shortened by folding and stitching. The operation is one which we would hardly expect to prove very useful, and, as a matter of experience, the results have not been good.

Halban[8] gives as the results from Schauta's clinic at Vienna twelve cases, with six ultimate failures.

Bucura[9] reports eighty-six of these operations performed by Wertheim for retroversion. In 21 per cent. of the cases the uterus fell back after a longer or a shorter interval.

Andersch reports twenty-nine cases, with fourteen ultimate failures. The operation does not seem to have been practised much, except by Schauta, Wertheim, and Pfannenstiel.

4. *The Alexander-Adams Operation.*—By this operation, as well as by ventrofixation, there is provided a distinct support from above; and it is, therefore, not surprising that these operations have been frequently combined with the vaginal plastic operation in extreme cases of prolapse.

The most recent communication on this subject is by Krönig and

Feuchtwanger,[10] who give the later results from Zweifel's clinic in Leipsic. In every case in which the operation was performed for prolapse it was combined with a plastic operation on the vagina. The results in forty-two cases which could be followed up were as follows: in fourteen cases there was no descent of the vagina, but the uterus in two cases was retroverted, in one case it had descended slightly; in twenty-eight cases there was some prolapse of the vagina; in four of these the uterus was retroverted, and in four cases prolapsed, but anteflexed. In other words, retroversion was found in six cases, prolapse of the uterus in five cases, and prolapse of the vagina in twenty-eight cases.

Städler[11] reports cases operated on by Gelpke, who combines the Alexander-Adams operation with Lawson Tait's operation on the perineum. He gives a list of twenty-five cases, with six failures, but the after-history is based chiefly on communications from the patients.

5. *Ventrofixation.* — Christiani[12] communicates the results of Küstner's operations in the Breslau clinic. He claims that Küstner is the only one who, since his first ventrofixation for prolapse, has systematically practised the combination of ventrofixation and colporrhaphy. The two operations are performed at a sitting, and stress is laid on free splitting and careful stitching of the recto-vaginal septum.

Ventrofixation was performed in 134 cases. In twenty of these (two of total and eighteen of partial prolapse) no further operation was performed. In the remaining cases a vaginal plastic operation was also performed. The author was successful in obtaining information as to the later results in 105 cases (sixty-five were examined by himself or by other medical men, and forty patients replied to his inquiries by letter). In nine case (8 per cent.) partial or total prolapse of the uterus was found on examination, or was inferred from the information supplied, and in twenty-four (22 per cent.) there was partial or total prolapse of the vagina. In twelve cases a ventral hernia occurred from stretching of the abdominal scar.

The author regards the position of the uterus after operation as much more important than the final result as regards the vaginal walls. In support of this opinion he states that the results of the operation, as estimated by the freedom of the patient from discomfort, are 82 per cent. of cures. He thinks that the reason why ventrofixation is not more popular in the treatment of prolapse is to be found in the failures which have followed the operation when performed alone. In his own cases failure occurred in 63 per cent.

when ventrofixation was performed alone or in combination with simple anterior colporrhaphy or amputation of the cervix, as against 20 per cent. of partial or complete failures resulting from ventrofixation combined with a thorough plastic vaginal operation. Even in cases of prolapse in nulliparous subjects simple ventrofixation is not suitable.

Boije[13] reports twenty-nine cases of ventrofixation and colporrhaphy from Engström's clinic, with three failures and six comparative failures.

Terrier[14] does not believe that vaginal and perineal operations are sufficient for the cure of prolapse, and practises ventrofixation in addition. He prefers ventrofixation to shortening of the round ligaments, as it renders practicable a thorough investigation of the pelvic organs. He performs ventrofixation first, and then waits for an interval of at least three weeks before he narrows the vagina. By that time, in many cases, a considerable diminution will be found in the size of the uterus, and especially in the supravaginal portion of the cervix when that has been elongated. For this reason he does not consider it necessary to amputate the cervix in every case. He reports four cases of the combined operation. In two of them the result was excellent after an interval of nine and five months respectively; the other two had only recently been discharged from the hospital.

It will be seen that Terrier meets an objection to ventrofixation that is often made, namely, that in cases where there is hypertrophy of the supravaginal cervix fixation of the body of the uterus to the abdominal wall will not pull up the lower part of the cervix.

Before passing to the consideration of the other operations, which are of an entirely different type from those we have been discussing, it will, perhaps, be well to notice recent contributions as to the frequency with which complications of labour occur as the result of the various fixation operations.

The subject is hardly mentioned in connection with *colporrhaphy*, and, as a great many of these operations are performed every year, we may take it for granted that the narrowing of the vagina does not influence the course of labour, except, perhaps, by causing some delay. It is true that the occurrence of labour after such an operation is the most frequent cause of the reappearance of prolapse. The parts are widely stretched by the passage of the child, but serious rupture seems hardly ever to occur, and, as a general rule, the state of affairs after the confinement is better than it was before the operation.

The influence of *vaginal fixation* in subsequent labours has given rise to much discussion, but the consensus of opinion is that, when the operation is performed in the way in which it was first introduced, the course of labour is often complicated, and in some cases very serious difficulties may be caused. The results, as regards pregnancy and labour, of the more recent methods (seroso-serous fixation, vesico - fixation, and low fixation) are not sufficiently numerous to enable us to form an opinion.

Dührssen[15] gives the results in twenty confinements following the seroso-serous operation. In only two of these was medical assistance required (one perforation on account of rigid cervix, one low forceps for inertia).

Andersch reports four confinements after the seroso-fibrous operation, all of which were normal, and two confinements after the seroso-serous operation, of which one was normal and the other required forceps on account of inertia. One patient miscarried, and three others were pregnant at the time of his communication.

Hohl states that in seven confinements which occurred after vaginal fixation there was no serious difficulty which could be ascribed to the operation, but version was performed in three of these cases. Kauffmann observed five pregnancies after the operation, one of which terminated in abortion. Of the four cases that went to full time, three were normal, and in one there was a transverse presentation and version was performed. He mentions that another case, in which vaginal fixation had been performed elsewhere, was admitted to Olshausen's clinic on account of a serious complication of labour, and that Cæsarean section was necessary. Rieck[16] reports thirty cases of pregnancy from a series of 1,000 vaginal fixations performed by Martin. Labour was complicated in five cases out of twenty which followed the old method of vaginal fixation (one Cæsarean section, one version on account of extreme stretching of the anterior lip of the cervix, one double incision of the posterior lip of the cervix and then forceps, one version for transverse presentation, and one version for cause not stated). In cases operated on by Martin's later method (fixation of uterus just above internal os) ten confinements occurred without complication. Rühl[17] has collected seventy-one cases of labour after vaginal fixation. In forty-nine labours following the older methods, three were seriously complicated, and required incisions in the anterior lip of the cervix and in the vagina. He analyzes the nine cases of Cæsarean section recorded after vaginal fixation, and thinks that only two of them can be fairly attributed to the operation.

Kleinwächter[18] gives a much more gloomy account of labours following vaginal fixation, from a consideration of 111 cases. Abortion occurred in 25 per cent., and labour was complicated in 32 per cent. of the eighty-three cases that went to term (nine forceps, seven Cæsarean sections, one deep incision of cervix).

There is not sufficient material at hand to help us in forming an opinion as to the effect upon pregnancy and labour of the operation of *shortening the round ligaments per vaginam*, but we may assume that from this point of view it resembles Alexander's operation. Experience shows that Alexander's operation has no ill effect on subsequent pregnancy or labour. Krönig and Feuchtwanger report eleven pregnancies and one abortion. The confinements at term were all normal. During pregnancy pain in the inguinal regions was sometimes complained of. Kleinwächter noted abortion eleven times in 112 cases, and states that the frequency of complications was not greater than under normal circumstances. Grusdew,[19] from an experience of thirty-one cases, holds the same opinion.

The results of *ventrofixation* in subsequent pregnancy and labour are now generally regarded as being on the whole favourable, but this opinion is not supported by the statistics furnished by Dorland,[20] who shows that abortion occurred in about 14 per cent. and serious trouble during labour in 12 per cent. (twenty-two complicated cases in 175 confinements). Nevertheless he believes that ventrofixation is the best method of fixation, both from the obstetric and the gynæcological point of view. Slight technical mistakes in the operation may lead to serious complications during labour. The dangers increase with the low fixation of the fundus uteri. According to Norris[21], who reports two cases of seriously complicated labour after ventrofixation, the maternal mortality in confinements complicated by previous fixation operations was 14 per cent., and the fœtal mortality 58 per cent. Christiani believes that complications are entirely due to faulty methods of operating, and condemns the fixation of the uterus to the fascia of the abdominal wall, as practised by Engström.

On sifting the evidence before us, as to the effect of prolapse operations on subsequent pregnancy and labour, we are led to the following conclusions: that colporrhaphy, perineorrhaphy and shortening of the round ligaments are all safe procedures; that the older methods of vaginal fixation and ventrofixation are highly dangerous; that by the newer methods of fixation the risks are largely eliminated; and that ventrofixation is safer than vaginal fixation.

We have now to consider two operations for prolapse the principle of which differs widely from those we have just dealt with. Freund's operation and the total extirpation of the prolapsed uterus make no attempt to restore the displaced parts to their original position; in the one case the uterus is dislocated so as to act as a resistant body to the forces which caused the prolapse, and in the other case it is removed altogether. These operations can only be contemplated for cases in which the patient has passed the climacteric, and in which a pessary cannot be used and plastic operations are insufficient. For this class of case they may be said to compete with each other.

6. *The Freund-Wertheim operation.*—The operations of Freund[22] and Wertheim[23] have the same object, but the methods differ. In the former the posterior fornix is opened and the fundus uteri pulled through the opening into the vagina. The anterior uterine wall (which now lies posteriorly) is then stitched to a raw surface on the posterior vaginal wall. Wertheim opens the anterior vaginal fornix, pulls the uterus down, and stitches its posterior wall to the anterior vaginal wall. Fritsch's[24] operation is the same as Wertheim's, with the addition that he stitches the anterior uterine wall to the posterior vaginal wall.

Comparatively few of these operations are recorded. Wertheim reports two cases with good immediate results, and at a later date sixteen cases from his clinic are reported by Bucura,[25] who states that recurrence of the prolapse occurred in only one case. Fritsch reports only one case, and makes no reference to the later result. Schauta has operated on six cases in a similar manner to Wertheim, and it is claimed that the results have been excellent (Schmit). Seven cases are reported by Mandelstamm.[26] Assaky[27] believes that the results of Freund's operation depend on the length of time that the sutures, which are left *in situ*, remain unabsorbed. He quotes Freund as saying that the operation is only suitable for slight prolapse in elderly women. Andersch mentions the case of a woman who presented herself at Pfannenstiel's clinic with a red swelling at the vulva. On examination this swelling proved to be the fundus of the uterus, and it was found that Wertheim's operation had been performed. The patient complained that the pressure of the uterus in the vagina caused her more trouble than the original prolapse.

On the whole, it cannot be said that this operation has aroused much enthusiasm, or has been followed by results which justify its existence as an operation for prolapse, even in old-standing cases in elderly women.

7. *Total extirpation of the uterus.*—The earliest case of removal of the uterus for prolapse to which a reference can be found is one by Toogood[28] in 1846, and a similar operation was performed by Choppin[29] in 1861. In those days, when plastic operations on the vagina and perineum were seldom practised, it was natural that some surgeons should be tempted to try radical measures in extreme cases of procidentia. But the operation was not seriously proposed until the technique of vaginal hysterectomy was simplified in the course of operations for cancer of the uterus. Since that time the operation has been frequently performed, but it has always been recognised as an exceptional procedure to be adopted only in cases of extreme prolapse in elderly women. Experience showed that it was not sufficient merely to remove the uterus, as that operation was frequently followed by prolapse of the vagina. It was therefore combined with a plastic operation on the vagina, or the stumps of the broad ligaments were stitched to the cut surface at the top of the vagina, or the cut surfaces of peritoneum were brought down and united to the vagina. Even with these precautions the results of the operation are not always as satisfactory as could be desired, and the present tendency seems to be to limit it more and more.

Fuchs[30] advocates total extirpation in combination with resection of the vagina and perineorrhaphy. He reports thirteen cases from the Breslau clinic. The permanent results could not be given on account of the short interval since the operations; the immediate results were good in eleven cases (84 per cent.), but in two prolapse of the anterior vaginal wall occurred.

Mangiagalli[31] reports twenty-seven cases with one death, and states that the ultimate results have been good. He thinks that vaginal hysterectomy is sometimes indicated in cases of prolapse with complications, and even in rare cases of simple prolapse, but is of opinion that it should always be combined with plastic operations on the vagina.

Schlatter[32] reports eight cases from the Bâle clinic, and has collected 178 other cases from various sources. The total mortality was 6·9 per cent., and in 132 cases which were followed up prolapse of the vagina occurred in five cases (3·78 per cent.). He gives the statistics of other writers as follows: Fehling with a mortality of 10 per cent. and recurrence in 7 per cent.; Zolotinsky with a mortality of 7 per cent. and recurrence in 11 per cent.; and Rauhut with a mortality of 8 per cent. and recurrence in 8·8 per cent.

Engström[33] has performed total extirpation combined with resection of the vagina in fifteen cases. All the cases recovered, but in

several prolapse of the vagina occurred at a later period. His indications are: total prolapse in elderly (and preferably unmarried) women who are in feeble health, as the operation is better borne in these cases than ventrofixation combined with colpoperineorrhaphy.

Froriep[34] reports six cases, of which five were examined at a later date. In four of these there was slight prolapse of the vaginal wall, which caused no discomfort.

More recently the operation has been rather adversely criticised. Sänger thinks that to extirpate the uterus on account of prolapse exceeds the object for which the operation is undertaken, just as much as Porro's operation does when undertaken in place of Cæsarean section. In his view the uterus ought to be retained as part of the pelvic floor. v. Herff gives the ultimate results of vaginal hysterectomy for prolapse as 51·7 per cent. cured. Andersch reports twelve cases, of whom eight were examined at a later date; three of these had marked prolapse of the posterior wall, and the result was good in the other five. He remarks that there is a temptation to remove the whole of the uterus in the hope that part of the patient's suffering will thereby be relieved, but at the same time one must not forget that by so doing one removes the natural support of the vagina, and makes it impossible afterwards to utilize the uterus as a means of preventing prolapse of the vagina, and in consequence one is helpless in dealing with a cystocele, should this afterwards occur. Christiani states that the operation is reserved in the Breslau clinic for cases of irreducible prolapse. In his opinion, an operation which has at the present time a mortality of nearly 7 per cent. cannot compete with methods that show much better results without mutilating the patient.

It is difficult to arrive at general conclusions from the mass of opinions to which we have referred, but we may try to summarize the impressions with which we are left as follows:

The most generally useful operations in cases of prolapse are the plastic operations on the vagina and perineum, and by many operators they are regarded as sufficient in almost all cases. Some operators think that retroversion plays an important part in the causation of prolapse, and for that reason recommend anterior-fixation operations in combination with colporrhaphy. The later results of these combined operations are not much better—if at all—than those obtained by some operators by colporrhaphy alone. The old method of vaginal fixation is highly dangerous from the point of view of subsequent pregnancy, and should be abandoned. The newer

methods of vaginal fixation give fairly good results in cases of slight prolapse, but are not suitable for the more extreme cases; and sufficient evidence has not yet been forthcoming as to their effect on subsequent parturition. The success following the operation of shortening the round ligaments *per vaginam* has been very poor as compared with that obtained by other operations. Alexander's operation does not seem to have met with much success in cases of prolapse. Ventrofixation combined with colporrhaphy gives better results, but there is always the fear of trouble in future pregnancy, although the obstetric complications which have been reported were probably due to the method of fixation employed, as they seem to have been less frequent in the last few years. The operations of Freund and Wertheim have not been established as satisfactory measures even in the limited class of cases to which they were supposed to be applicable. Total extirpation of the uterus is an operation which should only be employed in very exceptional circumstances, such as cases of extreme and troublesome, or irreducible, prolapse in elderly women, the condition of whose tissues renders a plastic operation unsuitable; or cases in which there exists, in addition to the prolapse, some other indication for the operation.

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REVIEW OF CURRENT LITERATURE

OBSTETRICS.

Remarks on the Ten Months of Utero-Gestation (B. S. SCHULTZE: *Cent. für Gynäk.*, No. 2, 1902).—The 280 days which pass on an average from the time of the last menstrual period until birth at full term, are divided by obstetricians into ten divisions, each consisting of twenty-eight days, and termed *months*. The women, on the other hand, use the ordinary calendar months in their calculations as to the term of pregnancy, and according to them the duration of normal pregnancy is nine months, to which a few days more must be added if reckoned from the first day of the last menstrual period.

In order to find the 280th day, on which birth at full term should take place, the rule is to count nine calendar months from the first day of the last menstrual period, and to add on four days in February, five days in December and January, six days in April and September, and seven days in each of the remaining five months. (If February has twenty-nine days, one day less is added from March to November.)

In the first half of pregnancy the difference between the months of the obstetricians and the calendar months does not signify much, but when the first half of pregnancy has just passed, the obstetrician naturally says that the sixth month has commenced, while the woman considers herself to be in the middle of the fifth month. In the eighth and ninth month misunderstandings are more frequent still; and the tenth month, which is a matter of course to the obstetrician, is perfectly unknown to the pregnant woman: she would certainly think she has passed her term if a tenth month is mentioned to her.

Differences of opinions and errors are frequent when the question arises as to the viability of the child. After seven obstetrical months, or twenty-eight weeks, the viability is still questionable; while after seven calendar months (thirty-one weeks) the chances are much more favourable. Difficulties may also arise where compulsory registration of the stillborn is limited by the age of the fœtus, if the age is estimated by months and not by weeks.

In answer to the question, Of what nature are these obstetrical months, ten of which are contained in the 280 days of normal utero-gestation? it is usually said that they are 'lunar' months. But a lunar month from new moon to new moon consists of twenty-nine days and a little over half a day. Ten lunar months consequently contain 295 to 296 days, not 280 days. It is evident that it is erroneous to call these months lunar months.

As to the origin of the ten obstetrical months, Hippocrates is supposed to have been their author; but it is hardly probable that Hippocrates should have reckoned by months consisting of twenty-eight days each. It is well known that the Greeks divided the year into actual lunar months long before Hippocrates; Solon ordered that the months should consist alternately of twenty-nine and thirty days. Nevertheless, the period of utero-gestation was even then stated at 280 days.

Fasbender clearly shows in his critical studies that the writings of Hippocrates mention a division of the term of pregnancy into four decades of weeks, also a division into seven periods, each consisting of forty days, or into forty periods, each consisting of seven days; but nowhere is mention made of ten four-weekly periods. It is consequently a mistake to make Hippocrates responsible for the term now used by obstetricians, and it would scarcely repay the trouble to enter into detailed investigations as to its origin. It is, however, not at all difficult to explain *how* the name 'month' applied to the duration of pregnancy arose. The flow of blood which occurs in healthy women periodically every four weeks is termed a menstrual period, or 'mensis.' Even during pregnancy the time of each period is marked by certain symptoms (molimina); the 280th day, on which the pregnancy should terminate, is also the day on which the tenth menstrual period should commence; therefore it is quite easy to understand that it seemed natural to divide the 280 days of pregnancy into ten menstrual periods, or ten menses.

It only now remains to translate the word *menses* by *months* (as no doubt has been done by ill-informed translators), and to use this term in singular, speaking of the second, the fourth, or the tenth month of pregnancy, in order to understand *how* the term 'ten months of pregnancy,' became familiar to obstetricians.

I recently proposed to a colleague of mine to do away with this term in the new edition of his manual. His answer was that nobody would buy the book. My own opinion, though, is that, if this alteration should surprise the reader, the surprise would be a pleasant one. It is not at all a question of finding a new name, or of the introduction of a new mode of calculating the duration of pregnancy —we always have used days and weeks for this purpose; all we need do now is to abolish the division of the 280 days into ten months.

In my manual of obstetrics for midwives, which was well received by the critics and had a large circulation in all its twelve editions, no one objected to the alteration which I introduced since 1860, for my own convenience as well as for the convenience of my pupils.

I can say the same about the text to my obstetrical tables. My firm belief is that it is time to do away entirely with the practice of

applying the name of ' months ' to the four-weekly periods by which we register the symptoms during pregnancy, and mark the stages of development of the fœtus. Let us adopt the reckoning in weeks instead of months (which, moreover, are no real months) in the manuals of obstetrics as well as in each individual case, and we shall find that our data will be much more accurate. Besides, we shall have the advantage of conforming in our calculation to the mode of reckoning which is in vogue in everyday life, an advantage which is not at all to be despised. H. G.-S.

A Case of Twin Pregnancy in a Uterus Bicornis Duplex (KOSLENKO: *Cent. für Gynäk.*, No. 2, 1902).—The patient was admitted on April 2, 1901, with the history of having been eleven times pregnant. The fourth and sixth pregnancies ended in abortion at the fourth month. The last pregnancy and delivery were normal. One child had lived. On examination the patient was well nourished; the bony skeleton was well developed. A sulcus was felt in the gravid uterus through the abdominal wall. Heart-sounds were heard distinctly both on the right and on the left of the middle line. The external genitals were normal. The presenting occiput lay deep in the pelvis, and the membranes were ruptured. The right side of the cervix was thicker than the left, and was pushed against the bony pelvis by the child's head. The pelvic measurements were: interspinous diameter 25 centimetres, intercristal 27 centimetres. The pains were strong, and in two hours after admission a living female child was born, soon followed by the placenta. It was now clear that the case was one of twins in a uterus bicornis. The left horn was well contracted and easily palpable, whilst the right part of the womb contained the second fœtus.

On internal examination the thick right portion of the cervix proved to be a partition wall dividing the canal. The first child had passed through the left compartment. The right canal was felt to admit three or four fingers, and through it the unruptured membranes and the presenting part of the fœtus, lying high up and still movable, were made out. The right horn was the weaker of the two, and the contraction pains correspondingly less brisk. The heart-sounds of the second child were feebler, and it was necessary to extract by forceps. A living female child was delivered under chloroform. Severe hæmorrhage ensued half an hour after delivery. The placenta had to be separated by the hand, expulsion by Credé's method having failed. It lay on the anterior wall of the right horn. It was now ascertained that the partition was complete, and the cervix possessed two separate entrances. The bleeding ceased after the extraction of the placenta, and the right horn contracted well. The puerperium was normal. The second child, from the right horn, died; the first and larger child lived. The first weighed

2,500 grammes, the second 2,000 grammes, and may have been the outcome of a later impregnation.

Whereas Müller and Kussmaul have found in these cases that the musculature of the uterus is feebly developed, and the pains consequently weak, it is noteworthy in the above instance that the left horn was not wanting in power to expel its contents. The patient had had nine normal deliveries; presumably on each of these occasions the left horn was the gravid one. There had been two abortions, occurring, perhaps, in the right horn. Two swellings were subsequently noticed on the anterior and posterior vaginal walls; these were probably partition 'rests.'

Müller and Kussmaul state that only one horn is fruitful, as a rule, in uterus bicornis duplex. Pfannenstiel draws attention to the delay in labour in cases of bicornute uteri, and states that this is due to the fact that the inclination of the horns does not correspond to that of the pelvis axis, so that the pregnant half assumes the position of exaggerated uterine obliquity; and, like the other observers mentioned, he draws attention to the imperfect development of the uterine muscle. Holzapfel and Tauffer state that the empty horn has proved to be an obstacle to delivery, just as an ovarian cyst might be. Lohlein described a case in which the non-gravid horn was in a position of fixed retroflexion; reposition was impossible, and the uterus ruptured. With regard to the menstrual history in these cases, Müller and Pfannenstiel have noted that the empty horn continues to menstruate during the gravid state of its fellow-horn. In the case above described this was so, for the menstrual function was normal. C. L.

Pregnancy in a Rudimentary Horn of a Uterus Bicornis Unicollis (KRÖNIG: *Cent. für Gynäk.*, No. 2, 1902).—The author first refers to eighty-two cases collected by Kehrer, half of which were described within the last thirteen years, and regards the condition as occurring more frequently than was formerly thought, the erroneous diagnosis of tubal gestation being often made. The treatment depends upon the extent to which the rudimentary horn is connected with the principal or larger cornu. If there is a small connecting pedicle, it can be ligatured and removed—in fact, treated like a gravid tube. If the pedicle is a wide one, semi-amputation has to be performed, or later in pregnancy stitching the sac to the abdominal wound, then removing its contents and packing with gauze, is advocated. In Kehrer's eighty-two cases, one only possessed a canalized pedicle which admitted of approaching the gestation sac from below. In this case there was a two-months gestation in a small rudimentary horn, and the treatment is not recorded. Nagel recommends that in more advanced pregnancy with decomposing gestation products an attempt should be made to

widen the cervical canal and deliver *per vaginam*. He asserts that the pedicle of the rudimentary horn will admit of more dilatation than is usually supposed. In justification of Nagel's statement, Kehrer records the following case:

The patient was aged twenty-three, and had been married for three and a half years. There had been two former confinements; in both the presentation was a breech, and both children lived. Soon after the last period (August 12, 1901) she suffered from sacral pain, anorexia, and faintness. On September 29, having missed her period for that month, she was seized with sudden, frequent, labour-like pains in the abdomen, followed soon by fluid hæmorrhage *per vaginam*. This ceased for a while, but recurred during the night, whilst the patient was out of bed, causing her to fall in a faint. The next day the patient was taken into hospital. The hæmorrhage had then ceased, but the patient was very collapsed. Under chloroform the os was found to be closed, the uterus slightly enlarged, anteflexed, and dextroposed. In the left of the uterus was a tumour the size of a small fist, connected to it by a pedicle the size of an index-finger. The tube and ovary were not to be felt on this side. The diagnosis of a tubal pregnancy with either a living or a recently-dead fœtus was now made. The sound passed to the right into the large uterine cavity. Laparotomy was performed on October 1, 1901. Two hundred and fifty c.c. of dark fluid blood were found in the peritoneal cavity. The uterus itself corresponded in size to a six-weeks pregnancy. From its left side proceeded a cord-like structure, of a finger's-breadth in thickness, which gradually expanded into a thin-walled, bluish sac. Running by the side of this sac lay the contracted tube, and externally and upon it ran the left round ligament. The ostia of the tubes were open. The operator was afraid to amputate the pedicle for fear of weakening the wall of the large horn to which it was attached, and thereby endanger the mother in the event of future pregnancies. He therefore dilated the canal of the left horn by means of Hegar's dilators, until the gestation products could be reached, and emptied the horn through the vagina. No fœtus was found. The bleeding ceased as soon as the placental tissue was removed, and beyond sponging out the abdominal cavity through the laparotomy wound, and closing the latter, nothing further was done. The patient was discharged in good health nineteen days later.

The difficulties in diagnosis are dilated upon. The occurrence of pregnancy in the small horn, by causing a softening of the pedicle, made it feel smaller than it really was. The principal horn was in the normal position of a somewhat enlarged uterus. In opening the peritoneum the presence of free blood for a time supported the idea of ruptured tubal gestation. No rupture could be found in the rudi-

mentary horn, but the possibility of its being hidden by fibrin is mentioned. The blood, however, may have come from the patent ostium of the tube. On the first suspicion of future pregnancy the author suggests immediate curetting of the rudimentary horn.

C. L.

Unique Case of Extra-uterine Pregnancy (TUHOLSKI: *Amer. Gynecol. and Obstet. Journ.*, Dec., 1901).—The writer points out that whereas it has not been proved that a fertilized ovum may become primarily implanted and develop in the abdominal cavity, secondary abdominal pregnancies have frequently been described, their usual fate being arrest of development. But all writers say that the proposition of a gestation sac containing a very young fœtus escaping completely out of the tube into the peritoneal cavity, and there becoming implanted and forming real placental connections, is not to be entertained. The following case proves that all this may occur, and the child live and go on to full development:

Mrs. X., aged thirty-nine, had given birth to six children in the course of twelve years; pregnancies and deliveries were normal. She ceased to menstruate on January 5 or 6, 1900, and menstruation being missed in February, she thought herself pregnant. About the middle of March she had a sudden attack of severe abdominal pain, accompanied by collapse. Under treatment she rallied, but remained weak, while a continuous discharge occurred from the uterus. Examination on May 10 showed the uterus to have reached the size of a ten to twelve weeks' pregnancy, the left tube and ovary thickened and adherent, but no sign of any swelling in the pelvis. The history suggested an extra-uterine gestation, but the pelvis was free from any swelling. Examination of the abdomen showed its lower zone resonant on percussion, but above the level of the umbilicus there was dulness of the whole abdomen continuous with the liver dulness. The lower margin of a mass in this portion could be easily outlined, and the fingers could be pushed under its margin. On examining the back, a well-marked protuberance was found in the region of the right kidney. Auscultation over this elicited a bruit, which was like a placental bruit. Was this, then, a case of secondary abdominal pregnancy in which death of the fœtus had not occurred? On May 16 Tuholski operated by a median incision. The liver margin was found half-way between the umbilicus and the pubis. On raising the liver, there appeared on its under surface a circular swelling traversed by innumerable large arteries and veins. It was pulsating and almost cystic to touch. The patient's condition was now so bad that no further exploration was made. Some surgeons present at the operation thought the swelling a tumor cavernosus of the liver. The woman recovered from the exploratory operation, and returned home after three weeks.

Some weeks later examination showed a great enlargement of the upper right side of the abdomen, and now the fœtal heart sounds and movements could be clearly made out. Finally, in September the writer again operated, making a free incision from the tip of the last rib downwards, then forwards, and upwards, as in Koenig's operation for nephrectomy. After dissecting through the tissues, a thin part of the sac was found. This was opened, and a lusty female child, weighing 6½ pounds, was removed. The cord was tied and the cavity firmly packed. The hand in tamponing passed upwards between the liver and kidney to the diaphragm. After operation the patient was much collapsed, and twenty-four hours later, as the temperature was rising rapidly, it was decided to change the tampon. The placenta at once began to distend, till it and blood filled the whole cavity. A tampon was rapidly inserted; the patient looked as if she were quickly dying of hæmorrhage, and she lived only eight hours.

Post-mortem examination showed the liver to be enormously enlarged and very vascular, and rotated on its axis till its right border presented near the middle line of the abdomen. The placenta occupied the right hypochondriac and part of the right lumbar regions; the placental attachment was to the diaphragm, the liver, and kidney. The intestines were free and normal; the uterus was enlarged; the left ovary and tube were thickened and adherent, while the right ovary and tube were apparently normal.

From the specimens and the previous history of the patient, the conclusion can be drawn that the young ovum, after having made its escape, found its way to the space between the liver and the peritoneum, or, more accurately, to that fold of peritoneum where the parietal layer is reflected over the under surface of the liver, forming the lower lamella of the coronary ligament. The sac developed with about three-fourths of its placental site on the parietal peritoneum; the remaining portion was closely connected with the under surface of the right lobe of the liver. On microscopic examination of the right tube, the primary placental site was found about 1 centimetre from the fimbriated extremity. The right ovary contained a well-developed fresh corpus luteum. J. L. L.

Mola Hæmatomatosa (DAVIDSOHN, E.: *Archiv für Gynäk.*, 1901, vol. lxv.; MICHOLITSCH: *Archiv für Gynäk.*, 1901, vol. lxv.—In the year 1892 Breus published a paper entitled 'Das Tuberöse subchoriale Hämatom der Decidua. Eine typische Form der Molenschwangerschaft.' In this work he described five or six specimens, obtained from cases of missed abortion, which he considered to be essentially different from the fleshy and bloody moles which have a well-known place alike in classic medical literature and in everyday practice. In Breus', as in other cases of missed abortion,

the signs of pregnancy appeared, and after three months or so disappeared with the exception of amenorrhœa and enlargement of the uterus. After some months the moles were expelled with pain and bleeding. The ovum in each case was about the size of a fist. The embryo, however, was seldom more than 10 or 11 millimetres in length—a very small embryo for an ovum measuring about 8 centimetres in diameter. There was no liquor amnii, the cavity of the ovum being practically obliterated by numerous folds and inpushings of the amnio-chorionic membrane, many of which were distended by altered blood-clots or 'tuberous subchorionic hæmatomata.' Breus held that these altered and retained ova were previously undescribed,* and he accounted for their formation by supposing that the embryo died at an early age, but that the membranes of the ovum continued to grow for some time after the death of the fœtus. The uterus having ceased to grow, the membranes became folded by their own growth, and projected into the amniotic cavity, the liquor amnii being absorbed. The subchorionic hæmorrhages were of secondary importance. A great deal of controversial literature, with reports of many cases, was published after Breus' paper. Gottschalk in the main agreed with Breus; Neumann and others strenuously opposed him, and maintained that the condition was primarily due to hæmorrhage from the decidua into the membranes of the ovum. Budin, by the way, published a case in 'Femmes en Couche,' and stated that the hæmatomata were subamniotic and not subchorionic. (In this he was probably wrong, as his figures closely resembled those of the other writers.) The details of the controversy up to the present time have presented no features of special interest; the two papers above named are, however, both new and important.

Davidsohn ('Zur Lehre von der Mola Hæmatomatosa') puts forward a new explanation of the causation of these moles, and describes two new cases. He makes the following statements:

1. That growth of the membranes of the ovum after the death of the embryo is only apparent.

2. That with the death of the embryo the growth of the uterus ceases.

3. That the ovum filled with hæmatomata occupies much more room in the uterine cavity than would be indicated by the development of the embryo.

4. That the striking disproportion between the fœtus and the whole ovum is not (as has been maintained) apparent only, but is real.

He next asks whether we are not familiar with a condition which is characterized by poor development of the embryo and a tendency

* The abstractor is much mistaken if exactly similar specimens have not been well described and figured by Velpeau, Morgagni, and even earlier writers, also by British observers of less antiquity.

to its death, and also by the large size of the sac of the ovum and of the uterine cavity. The answer is that in hydramnios both these features are present. The writer therefore maintains that the mola hæmatomatosa is a special kind of mole produced when an ovum affected by hydramnios perishes early in pregnancy, but is retained for some time *in utero* prior to its expulsion. In abortions with hydramnios the embryo is often about 10 millimetres long, while the ovum is 8 centimetres or so in diameter and has abundant villi. On the death of the embryo without expulsion, absorption of the liquor amnii would follow, and the membranes would gradually become folded and pouched, so that their convolutions would project into and occupy the amniotic cavity. The alteration of pressure within the uterus would suffice to cause the subchorionic hæmorrhages. For a time the uterine body would remain enlarged, for the space emptied by the absorption of liquor amnii would continually be reoccupied by blood extravasated into the folds of the amnio-chorion. Shrinking of the uterus would, however, ultimately occur, and would account for the smaller foldings of the membranes which are observed between the hæmatomata in most specimens. The writer restates the features characterizing the mola hæmatomatosa as follows :

1. The disproportion between the size of the ovum and the duration of pregnancy (clinically ' missed abortion ').
2. The small development of the embryo.
3. The subchorionic tuberosities or hæmatomata.
4. The excessive folding of the chorion and amnion.

Any of these features may occur alone in other products of abortion, but when they occur together the writer holds that they constitute a definite variety of mole. To clearly define this he adds a fifth ' genetic character,' namely :

5. The existence of hydramnios previous to the death of the ovum.

Micholitsch (' Ein Fall von Breus'scher Hämatomole mit blasenähnlicher Degeneration der Chorionzotten ') describes a case in which vesicular degeneration of the chorion was, for the first time on record, observed in a case of missed abortion, the mole being of the variety described by Breus.

Early in October, 1900, a woman aged thirty-eight, who had been confined normally eight times, desired to be informed if she were pregnant. Menstruation had been regular until July 1, 1900. Three months' pregnancy was diagnosed. On March 22, 1901, she complained of slight vaginal bleeding of five months' duration. The uterus was then the size of a large fist, and softer in some parts than in others. Molar pregnancy was diagnosed, and two days later, with slight pains and profuse bleeding, the complete ovum was expelled.

Rather smaller than a fist, its surface was covered with vesicles varying in size up to that of a pea, formed and arranged in the manner usual in vesicular degeneration of the chorion. In parts the decidua was well preserved; elsewhere it appeared to have been destroyed by the degenerated villi. The cavity of the ovum contained a little turgid fluid, and presented the typical appearance of the 'hæmatomole,' as described by Breus, the cavity being filled by a large number of bosses varying in size up to that of a hazel-nut, and deep blue in colour. The membranes between these were much folded and in parts were stained with blood pigment. The well-preserved embryo measured 11 millimetres in length, and the dropsical cord was $2\frac{1}{2}$ centimetres long. The microscopic appearances were like those described by Gottschalk, with marked inflammatory infiltration of the decidua. W. E. F.

Artificial Serum Enemata in Hyperemesis Gravidarum.—CONDAMIN (*Lyon Médical*, Feb. 2, 1902), on the strength of seven or eight highly successful cases, strongly advocates the treatment of uncontrollable vomiting in pregnancy by saline enemata. The more or less general intoxication of the organism under certain circumstances in pregnancy is the cause of hyperemesis gravidarum. The offending toxines must be expelled from the organism by subcutaneous injections, or, better still, enemata of artificial serum, which effect a true *lavage* of the blood, the stomach being kept in absolute rest for a week or a fortnight. A young woman came under his care quite prostrated by hyperemesis; emaciation was extreme, and she could not stand upright even if supported. For three weeks she had been unable to keep down any solid or liquid food, and all medical agents had failed. The temperature was low, and cerebral symptoms were suspected. Condamin judged that she was too ill to allow of the induction of abortion. He therefore tried the injection of 3 or 4 litres (about 5 to 7 pints) daily of artificial serum in enemata of 300 grammes (a little over $\frac{1}{2}$ pint) frequently repeated, just as though it were a case of an anæmic patient to be strengthened before an operation. Nothing was given by the mouth. Next day the urine was excreted much more freely, and the patient revived from her previously apathetic condition. For six days the treatment was continued, then a little broth was prescribed, but the patient refused to take it, dreading the vomiting and the painful pyloric spasms which followed the ingestion of the least drop of fluid. The saline enemata gave her great comfort. On the eleventh day she felt so well as to accept a little nourishment, which was easily tolerated. Gradually the appetite came back, and she at length returned home quite cured. Since this case occurred a few years since, Condamin has never had to induce abortion in hyperemesis gravidarum. It is necessary to be thorough and to keep the stomach

absolutely empty for at least a week, or, better still, twelve days, relying on the saline enemata to sustain life. In subsequent early cases he tried feeding by the stomach at the end of four or five days, when it happened that the patient had an appetite, but the vomiting returned. After twelve days a few small draughts of liquid may be taken by the mouth and gradually increased, the enemata being for awhile continued. When the rectum is intolerant a few drops of tincture of opium should be added to each enema, and if then the enemata are not well retained subcutaneous injections will be needed. A. D.

Two Cases of Laparotomy for Spontaneous Rupture of the Uterus (TÖRNGREN: *Cent. für Gynäk.*, No. 1, 1902).—In the first case the patient was forty-one years of age, with the history of having had three normal labours, one abortion, and two deliveries with the aid of forceps. On the evening of September 28, 1892, the membranes ruptured. At 5 a.m. the next morning she felt very ill and the pains ceased. She was then taken into the hospital. The pelvic measurements were as follows: Baudelocque's diameter, 18 centimetres; interspinous, 23 centimetres; intercristal, 28 centimetres; bitrochanteric diameter, 31 centimetres; diagonal conjugate, 10·5 centimetres; true conjugate, 8·8 centimetres. The child's head was movable above the narrow brim and the cervix fully dilated. On admission the abdomen was distended and tender; the buttocks of the fœtus were palpable through the abdominal wall with remarkable ease. Fœtal heart-sounds could not be heard. On passing the catheter, the point came out in the vagina. Pushing back the head from the pelvic inlet caused considerable hæmorrhage *per vaginam*. Cephalotripsy was easily carried out, but there was much loss of blood. A tear was found running obliquely across the anterior uterine wall at the level of the retraction ring. From the mid-point of this oblique tear another ran in the long axis of the uterus downwards into the vesico-vaginal wall to within 4 centimetres of the urethral orifice. The entire tear was therefore T-shaped. The placenta was found in the abdominal cavity to the right of the uterus. The mucous surfaces of the oblique and vertical tears were sewn up *per vaginam*. The abdomen was next opened, and the vesical tear examined from above. It reached to the fundus. The oblique rupture in the anterior uterine wall measured 9 centimetres, extending on the right to the broad ligament, the folds of which were separated by blood-clot. To the right of the mid-line there was a gangrenous area the size of a hazel-nut lying on both sides of the tear, and a foul odour was noticed on opening the abdomen. The gangrenous tissue was cut away by scissors. The bladder wall was sutured by catgut; the uterine muscle was sewn up also with catgut, as was the peritoneal coat.

No drainage was employed. The patient died of sepsis two days after operation.

The second case was that of a woman aged forty-three, who had had twelve children. The last confinement, in 1898, was instrumental; the child was born dead. The other births were normal. The patient was admitted on May 4, 1901, with a very pendulous abdomen. The pelvis was normal. The child was alive, and presenting by its head. The os admitted three fingers; the membranes were unruptured. The urine contained a large amount of albumen. The membranes ruptured on May 5, the os being then fully dilated. The child's head could not be reached through the vagina. Later the left (posterior) parietal bone was felt to engage in the pelvic brim. As no advance was made, after waiting half an hour, an attempt was made to correct the position, and as this failed turning was performed two hours later. Whilst drawing down a foot a rupture was discovered in the anterior wall of the lower segment, and through this the child's head projected. There was not much hæmorrhage. Laparotomy was performed seven hours later. On cutting through the abdominal wall coagulated blood was found between the deep fascia and peritoneum. The peritoneum was torn and separated from the anterior uterine wall to as high as its middle, and the tear and separation extended through the parietal peritoneum of the anterior abdominal wall to the same level. The uterus and intestines were surrounded by blood-clot, and a complete rupture, 10 centimetres long, was seen in the anterior wall of the lower segment. After ligating the adnexa, amputation through the lower segment was performed at the level of the tear. The cervical stump was covered by suturing the anterior and posterior peritoneal flaps. The woman made an uneventful recovery. In this case the child's head was unusually large, the measurements being: biparietal, 11 centimetres; bitemporal, 9·25 centimetres; suboccipito-bregmatic, 9·5 centimetres. Microscopically it was stated that the elastic fibres of the uterus in the neighbourhood of the tear did not stain with Weigert's resorcin-rosanilin, contrasting in this particular with the rest of the uterus and with the fresh tissue of a pregnant uterus, used as a control experiment.

Törngren makes no comment upon the fatal case, as it concerns the surgery of nearly ten years ago. No surgeon at the present time would cut out a gangrenous area from a ruptured uterus and leave the remainder of the organ behind, closing up the abdomen and not providing for drainage. In the second case Törngren suggests that the rupture was due to degenerative changes in the elastic fibres of the uterus. The evidence brought forward in support of this theory does not seem very convincing. It is quite possible that the rupture took place during turning. It is note-

worthy that at first the head was movable and over the brim, but after turning it was found to be in the abdominal cavity. Seven hours after rupture and delivery it is stated that the patient's condition was good, and it therefore appears that this would have been a case *par excellence* for treatment by packing the rent with iodoform gauze. Törngren mentions this alternative treatment, stating that it has an important place in private practice, but he speaks of it as a half-measure which is not to be recommended as the best practice in hospital. C. L.

Tearing of Parametric Vessels during Parturition with Fatal Result (*Cent. für Gynäk.*, No. 52, 1901).—LEOPOLD described a case in which death was due to hæmorrhage into the abdominal cavity occurring in parturition without rupture of the uterus. The patient was thirty-four years of age; she showed signs of advanced rickets, was badly nourished, and somewhat demented. Her first two confinements (1889 and 1898) were normal; the third, in 1899, was difficult, and the presentation being transverse, turning was necessary, and the child was still-born. She came to the hospital on January 20, 1901, with a history of having suffered for four years from epileptic fits. She was eight months pregnant; her urine contained one-fifth its bulk of albumin. The pelvic measurements were: interspinous, 9·6 inches; intercristal, 10·4 inches; bitrochanteric, 12·8 inches; external conjugate, 6·8 inches; diagonal conjugate, 3·9 inches; true conjugate, 3·1 inches; bi-ischiatic, 3·2 inches. The head was very movable above the narrow brim. A hydrostatic colpeurynter was inserted to hasten dilatation and to protect the bladder. This was retained for four hours and a half, when regular and strong pains began and the membranes ruptured, but only a small quantity of liquor amnii escaped, and the head of the child had not engaged in the brim. The sagittal suture lay above the symphysis, and there was posterior parietal obliquity. Three fingers' breadth below the umbilicus Bandl's ring was felt. Turning under deep anæsthesia was carried out with the greatest difficulty. The child lived for six hours and a half; it was 19 inches long, and weighed 2,750 grammes. After the birth of the fœtus the uterus contracted well. There was no bleeding. The temperature was subnormal, and the pulse 120. Five minutes later the placenta came away entire. Seven hours after delivery the uterus relaxed, but there was no vaginal hæmorrhage; the pulse increased in frequency; there was great restlessness; consciousness was retained. The patient's head was lowered; 500 grammes of Koch's solution was injected without improvement. A soft tumour was now felt in the right broad ligament, the size of a hen's egg. No tear in the uterus could be found on examination; the uterus was packed and counter-pressure applied to the right broad ligament. The patient

died nine hours and a half after delivery. The autopsy revealed a hæmatoma in the right parametrium, which had *ruptured*, and 1½ litres of fluid blood were found in the peritoneal cavity; there was no rupture of the uterus; hypertrophy of the left and dilatation of the right ventricle were found and subacute nephritis. The hæmatocele had spread from the right broad ligament into the retroperitoneal tissue around the rectum and upwards into the peri-renal tissues. The tear in the broad ligament was 3 centimetres long. C. L.

Clinical Notes on Twenty-six Cases of Eclampsia.—HIRIGOYEN (*Rev. Mens. de Gynéc., et Obstét. et Pædiat. de Bordeaux*, Dec., 1901) gives an interesting *résumé* of the observations and treatment carried out by him on all the cases of eclampsia that were admitted into the Bordeaux Maternity from July 1, 1898, to the present time. These comprise 26 cases out of a total of 2,500. With regard to the *maternal mortality* there were three deaths in the twenty-six cases, but as one of them was due to rupture of the lower uterine segment, which contained a large myoma, the mortality arising from eclampsia is reduced to two, or a maternal death-rate of 7·7 per cent. The twenty-eight children (there being two cases of twins) yielded a *fœtal mortality* of only 17 per cent. instead of 50 per cent., the proportion quoted by most authorities. The majority of the women had albuminuria during pregnancy. In many, however, the presence of albumin was only ascertained during labour, and in one case only after the onset of the fits. The author appears to think that the issue of the illness is not in any way affected either by the amount of urine excreted or by the quantity of albumin, and furthermore that pyrexia, or the presence of gastric and nervous complications, cannot in all cases be considered to be an indication of the gravity of the disease.

The *prognosis* appears to vary with the period of onset of the attacks, being usually favourable when the fits are infrequent and mild, and occur after delivery, and presenting a grave aspect when there are frequent seizures from the commencement of labour, and when the cervix dilates with extreme slowness or not at all, and when there are well-marked signs of auto-intoxication.

Treatment.—In mild cases the author confines himself to at once administering chloroform by inhalation on the first sign that an attack is impending. He carefully watches the patient for a sufficient time after having given her an enema containing 4 grammes of chloral, which can be repeated if necessary, and orders milk and 'diète hydrique.' When the case is more serious, Hirigoyen has recourse to large rectal injections (10 to 12 litres), and to subcutaneous injections, of artificial serum (300 to 500 grammes), frequently repeated. In two or three cases he has abstracted about 400 grammes of blood. With regard to obstetrical management,

the author advises in those cases in which the fits are serious from the first that labour should be hastened, if it has already commenced, and induced if it has not, and delivery effected as quickly as possible by the employment of rapid digital dilatation and application of forceps. H. J. P.

Placental Cysts.—PITHA (*Annales de Gynéc. et d'Obstét.*, Jan., 1902) publishes a short monograph on this subject, together with some good macroscopical and microscopical drawings. The subject of placental cysts has met with some attention from time to time, but few writers agree as to their exact pathological origin. Pitha gives a drawing of a placenta showing several ovoid cysts occupying the fœtal surface. One of these measured 19 by 17 centimetres, and another 14 by 6 by 4 centimetres. There were several smaller independent cysts of a similar nature. Large vessels from the chorion appeared to supply the cystic swellings, and their ramifications could be traced over the cyst walls.

The amnion was found to cover these cysts and to move freely over them. The largest contained a sero-mucous fluid in which floated a number of fibrinous flakes. The fluid, examined chemically by Horbaczewski, was found to be colourless and opalescent, with an abundant sediment. It was precipitated by azotic, acetic, and carbonic acids, the sediment giving the reactions of an albumin.

Microscopically the amnion covering these cysts appeared normal, the fibrous layer being thinned only over the larger cysts. The chorionic villi in most places were natural, and there was no indication of hyperplasia. Any changes noted were rather those of retrogression, which chiefly affected the vessels. Langhan's layer was found in most places to be normal, except where it was displaced towards the fœtal surface by the larger cysts. Deeper still, near the base of the cysts, the chorion presented the appearances seen in a placental infarct, with villi in various stages of necrosis, abundance of fibrin and decidual structures; in fact, the base of the cysts was formed by decidual cells.

[Apparently these islets of fibrin in which decidual cells are embedded exactly correspond to what are described by English pathologists as 'white infarcts'—*i.e.*, deposits of fibrin in the deeper layers of the decidua serotina, formed upon the surface of chorionic villi the vessels of which are undergoing retrograde processes, the source of such fibrin being probably from the maternal blood of the intervillous spaces.]

Pitha, however, thinks that the fibrin is produced by the decidual cells, and is mostly found where the circulation in the intervillous spaces is diminished, and where the islands of decidual tissue cut off from the larger matrix are undergoing retrogressive metamorphoses. The fluid thus produced displaces upward the

fibrous layers of the decidua serotina, but in all cases the base of such cysts is formed by cells undergoing changes due to necrosis and pressure, thus resembling an infarct. The growth of the cyst is accompanied by the desquamation of decidual cells into its interior, and probably the larger cysts are formed by smaller ones opening into one another. Small cysts generally contain clear fluid, but the larger ones are sometimes filled with flocculent fibrinous débris, or even blood.

Pitha thinks that placental cysts are of frequent occurrence upon the fœtal surface of the placenta, and that their mode of formation is practically identical with placental infarcts, the only difference being in the evolution of the process. When the mass of villi, decidual cells, and fibrin still retains a limited connection with the decidua serotina a white superficial placental infarct is the result. When, however, this connection is broken by the production of fluid excreted by the decidual cells, which accumulates between the fibrous chorion above and the mass of decidual cells and chorionic tissue below, a subchorionic placental cyst is formed. It would be interesting to know if Pitha had examined placentæ other than those at full time, as it is well known that retrograde changes are met with long before the placenta is ripe, such changes being physiological, and not in any sense pathological. C. H. R.

The Ophthalmias of the Newly-born and their Prophylaxis (PINARD: *Annales de Gynéc. et d'Obstét.*, Jan., 1902).—The serious results of this disease are clearly pointed out in this monograph, and its frequency as a common cause of blindness is insisted on. Of particular interest is the account of the additions to our knowledge of its etiology with the advance of modern bacteriological research, and many valuable papers are referred to.

Pinard points out, with regard to the term 'purulent ophthalmia,' that there are *many ophthalmias* of the newly-born, all of which are due to infection, and that, although it is proved that the gonococcus is the direct cause in the majority of cases, there are other pathogenic agents which may infect the conjunctiva, such as the streptococcus, Lœffler's bacillus, staphylococcus, pneumococcus, etc. Fraenkel has observed the following in order of frequency in ophthalmia neonatorum: (*a*) gonococcus; (*b*) pneumococcus; (*c*) the bacillus of Koch and Weeks; (*d*) the diplobacillus of Morax and Axenfeld; (*e*) the *Bacillus coli*; (*f*) the bacillus of diphtheria; (*g*) an intracellular diplococcus, and the *Meningococcus intracellularis*. Chartres found pure gonococcus infection in 36 per cent. of his cases, and Gonin in 58 per cent. The latter, however, notes two cases of ophthalmia in which no micro-organisms could be found.

With regard to the exact time of infection, Pinard thinks that it is most frequently at the time of birth, or immediately before—that

is to say, when the eyes of the infant are in contact with the vaginal walls. The conjunctiva of the infant also is peculiarly susceptible to infection as compared with that of the adult. It is also possible that infection may occur within the uterine cavity, after rupture of the membranes. Such infection would come from without, conveyed by unclean fingers, douches, or instruments. Ophthalmias resulting from infection contracted in the uterus or the vagina are termed *primary*, and appear almost at once. Another set of cases are termed *secondary*—*i.e.*, infections occurring after birth, and due to the environment of the child, and for which the nurse is often responsible. Here the symptoms do not show themselves till the fifth or sixth day, or even later. Pinard thinks these are true secondary infections, and not attenuated primary infections, as held by some writers.

As regards *prophylaxis*, the ideal treatment is to prevent micro-organisms reaching the child's eyes either before or after its birth. Hence, there are before us the two important questions of the disinfection of the genital canal of the mother before labour, and the disinfection of the eyes of the child at its birth.

Complete disinfection of the genital canal before labour is a difficult, if not an impossible, matter. In normal cases, according to English obstetricians, it is probably unnecessary, for though micro-organisms may exist in the vagina in health, they are diminished or washed out by the liquor amnii, or, if present, such organisms would not infect the child's eyes. The uterus normally contains no micro-organisms except in the cervical canal. In cases of discharge, gonorrhœal or other, we should not only endeavour to make a bacteriological examination of such discharges, but to thoroughly disinfect the vagina and cervix before labour. This may not only prevent ophthalmia, but may safeguard the woman against puerperal fever.

Crédé found that in cases of women affected with vaginitis, antiseptic douches before labour diminished the number of cases of ophthalmia to some extent, but not markedly so. Since 1880 he has, in the Leipzig Maternity, instituted vaginal injections of carbolic acid solution in every case pregnant or in labour, and each new-born child is treated by dropping into its eyes a solution of nitrate of silver (1 in 50). This reduced the percentage of ophthalmias from 8 per cent. and 9 per cent. (between 1875 and 1880) to about 5 per cent. This solution of silver is certainly very strong, and some cases of conjunctivitis actually appeared to be due to it.

Schröder, between October, 1883, and October, 1884, using 1 in 1,000 corrosive sublimate solution on 1,015 children, noted seven cases of ophthalmia, while between October, 1884, and April, 1885, where 1 in 5,000 was used, only two cases occurred. Kalten-

bach, in 1885, using distilled water, had no cases of ophthalmia. Ahlfeld, since 1887, has abandoned antiseptic instillations, and, like Kaltenbach, uses distilled water or alcohol, but he endeavours also to disinfect the vagina of the pregnant or parturient women. Budin, in the Clinique Tarnier, now uses weak solutions of nitrate of silver. Champetier de Ribes prefers nitrate of silver, 1 in 50, or 1 in 100, followed by a wash of permanganate of potash. He reports in 1896 fifteen cases of ophthalmia, or 1·68 per cent.; in 1897 the percentage was 0·7 per cent. in 943 confinements, and in 1898 1·01 per cent.

Lepage, at the Maternité de la Pitié, employs lukewarm boiled water, and then nitrate of silver 1 in 150. From February 1, 1898, to May 31, 1901, there were ten cases of ophthalmia = 0·75 per cent.

Pinard, at the Clinique Baudelocque, has used nitrate of silver, biniodide of mercury (1 in 4,000), lemon-juice, citric acid (5 per cent.), permanganate of potash, and recently a solution of aniodol. The results obtained are as follows:

Year.	No. of Cases of Ophthalmia.	
	Primary.	Secondary.
1890	21	6
1891	11	2
1892	17	4
1893	12	12
1894	19	19
1895	6	13
1896	11	6
1897	16	11
1898	9	2
1899	9	6
	131	91

Looking at these facts, the writer points out that, much in the same way as the puerperal mortality has diminished by antiseptic midwifery, similar antiseptic treatment has produced good results in the ophthalmias of the newly-born, the percentage having now fallen to about 1 per cent.

In conclusion, Pinard remarks that the employment of different antiseptic methods in endeavouring to obtain asepsis of the genital passages before confinement, combined with asepsis of the fœtal ocular apparatus at the time of birth and during the three weeks that follow, have diminished the number of purulent ophthalmias considerably, *whatever the antiseptic agent employed*, but that, like puerperal fever, cases still occur, and will continue to do so.

Not only must we hope for good results from antiseptic *prophylactic* treatment, but also from *curative* treatment applied in the same way; and in the latter case we shall get better results the sooner such treatment is commenced. Pinard attaches great importance to such

curative measures being applied under the supervision of ophthalmic surgeons, and he further advocates very strongly that every large Lying-In Institution should have at least one such specialist attached to its staff. C. H. R.

Researches in the Anatomy and Physiology of the Breast.—KEIFFER (*L'Obstét.*, Sept., 1901), contributes a paper on this subject, illustrated by twenty-four micro-photographs. The paper is too full of technical detail for satisfactory abstraction. The observations were made on pregnant bitches which were anæsthetized, bled to death and injected. The sections are meant to illustrate the nerves of the nipple, the vascular system and gland structure of the breast. References are made to experimental and clinical physiology. The author considers that milk is the result of a cellular proliferation of the epithelium of the glandular acini, of an enormous swelling of all the cellular elements at the expense of the blood-fluids in circulation at the time of lactation, and of a transformation of the cellular protoplasm, thus enriched, due to the influence of the nucleus. Milk, therefore, is a living tissue, and has its maximum value at the time of secretion.—P. PLANCHON, in the same journal, contributes a note **On the Quantities of Milk to be given to Feeble Infants during the First Ten Days after Birth.** By feeble infants the author means premature children, or those weighing less than 2½ kilos. The article is practically a corroboration of Budin's work in the *Nourrisson*. From the second day to the tenth, on an average, the milk-supply should be trebled; thus a child weighing about 2 kilos gets 125 grammes of mother's milk on the second day, and 410 the tenth, in Budin's table. Planchon's gives 120 and 404. E. H. O.

GYNÆCOLOGY.

The Topography of the Uterus and Bladder after Alexander-Adams' Operation (*Cent. für Gynäk.*, No. 3, 1902).—BULIUS states that directly after this operation the fundus of the uterus generally lies two or three finger-breadths above the pelvic inlet. The portio vaginalis is drawn up, and lies nearer the anterior than the posterior pelvic wall, on a level with the pubic arch. The position of the portio depends upon the size of the uterus, and on the laxity or otherwise of the uterine ligaments, and the vaginal wall. The shortening of the round ligaments does not place the uterus in the normal position; it draws forward the fundus only, not the whole uterus. Other factors then come into play to bring about the normal amount of anteversion and flexion. The shortening of the round ligaments also elevates the uterus, so that the fundus will lie as high as 5 or 6 centimetres above the pelvic inlet, and close to the

anterior abdominal wall. The relation of the uterus to the bladder after this operation is important, as the following case recorded by Bulius shows:

Alexander-Adams' operation was performed in January, 1901, and when the patient left the hospital the uterus was extended, the fundus lying 3 centimetres above the pubes, close to the abdominal wall. When examined in July, 1901, the fundus was found halfway between the symphysis and umbilicus, the portio was drawn backwards and upwards, the anterior vault was depressed. The bladder was distended; 500 c.c. of urine were drawn off, and then the fundus sank to the position it took up on leaving the hospital. By putting 100 c.c. of fluid into the bladder the position of the uterus was not altered; 200 c.c. of fluid caused the uterus to rise ½ centimetre and to drop back from the abdominal wall. On drawing off the fluid the uterus returned to the old position. This proved that the ligaments can after shortening quickly assume their normal function.

Bulius has confirmed these observations in two other cases, one of which was complicated by shortening of the anterior vaginal wall, by a previous colporrhaphy, but this made no difference to the result. He argues that, since the shortened ligaments can so easily recover their normal function, no possible trouble can result from pregnancy occurring after the performance of Alexander-Adams' operation.

N.B.—In the operations above referred to the ligaments were shortened to the extent of 10 centimetres on each side. C. L.

Total Inversion of the Uterus by a Fibromyoma (AMANN: *Cent. für Gynäk.*, No. 1, 1902).—The author mentions the fact that complete inversion of cervix and uterus is very rare, the only cases recorded in literature being those of M'Clintock, Fritsch, Schauta, and Kustner. As a rule, the cervix remains *in situ* or shares the inversion in part only, the process not involving the external os. Amann's case was that of a patient aged forty-one years, who had been twice delivered, on the first occasion by forceps; the second confinement and puerperium were normal, and occurred fourteen years previously. Prolapsus uteri had been present for many years; it had been complete for one year, but the patient could replace the uterus herself. A fortnight before admission a tumour made its appearance at the vulva after straining; it increased rapidly in size, and was accompanied by hæmorrhage, high temperature, and rigors. On examination, there projected at the vulva a club-shaped tumour the size of a child's head. Overlying this was the sausage-shaped inverted uterus, which to some extent had acquired adhesions to the external genitals, and was divided by a constriction corresponding to the internal os; in front of the constrictor, and felt through the anterior vaginal wall, was the inverted cervix; and there was nothing present to mark the position of the

external os. The internal ostia of the Fallopian tubes were seen as slit-like depressions on the back part of the inverted body cavity, which was covered by horny epithelium. The tumour arose from the right side of the uterus, to which it was attached by a narrow pedicle; it had become adherent to the left genitals by a wide base, and was sloughing. The bladder was not prolapsed.

In spite of general sepsis being present, the uterus and tumour were removed, and the patient bore the operation well, and was better after the removal of the offensive fibroid. The bladder and rectal functions improved, but the patient eventually (no date given) succumbed. C. L.

Distinction between Sloughing and Degenerate Fibroids of the Uterus.—QUÉNU (*Bull. et Mém. de la Soc. de Chirurg. de Paris*, Jan. 28, 1902) led an interesting discussion on the question as to whether gangrene of interstitial and subserous myomata of the uterus was common, many authorities holding that it is rare, and yet has been confounded with a destructive process, essentially not gangrene, which is quite frequent. A similar discussion was raised at the meeting in November, 1901, of the Obstetrical Society of London, where a case was read by Mr. Alban Doran and Dr. Cuthbert Lockyer of a fibroid which stood out from the left cornu of a uterus quite small and otherwise free from any similar growth; the tumour, badly placed for its own nutrition, had undergone the change which Quénu disputes. Bisch could only collect thirty-seven cases of true gangrene of fibroids. The mortality when hysterectomy was undertaken was sixteen in twenty-two, yet Quénu reminded the experienced that cases of the so-called sloughy interstitial fibroid were very familiar, and not very deadly to tackle. These were to be called 'degenerate fibroids.' On section they appeared slaty or of a dead-leaf tone, or sometimes like india-rubber. A few yellow specks were often seen. There was frequently a faint, disagreeable odour. New fibrous tissue replaced the muscle cells; the vessels were to be found intact, contracted, yet permeable, never thrombosed. Thus, there is a circulation, though it is very incomplete. Pyogenic microbes have been found in tumours in this condition; on the other hand, cultivations sometimes remain sterile. In gangrene the circulation is suppressed, and the tissues are invaded by the microbes of putrefaction. No doubt a degenerate fibroid is liable to gangrene, but as a rule that change does not occur.

The endometrium is, in all probability, the channel for the entry of saprogenous germs, but Quénu is not sure that this is by any means the rule. He adds that personally he only knows of four cases where the cause was evident; in all sloughing followed galvano-puncture. Michaut believed that Quénu made too absolute a distinction between degenerate and gangrenous fibroids. The removal

of the former proved very dangerous in his experience. Peyrot agreed with this opinion. There were microbian gangrenes where mortification was the predominating phenomenon; putrefaction was little marked or absent. Hartmann agreed rather with Quénu; degenerate fibroids were, he thought, not necessarily on the road to gangrene. He had even seen apoplectic areas on section after hysterectomy for the removal of fibroids where there was a clinical history of recent attacks of pain, with enlargement of the tumour. On the other hand, Terrier has operated in three and Hartmann in one case of true gangrene of an interstitial fibroid. This condition is, however, far rarer than degeneration, which seldom ends in actual sloughing. A. D.

The Operation for Cancer of the Uterus by Means of Schuchardt's Perineo-Vaginal Incisions (F. SCHAUTA: *Monats. für Geburts. und Gynäk.*, Feb., 1902).—The author states that in trying to improve the results of operations for cancer of the uterus every means must be tried, including careful selection of cases and all kinds of operative procedures. He had himself carried selection to such an extent that he only operated on 14·7 per cent. of all cancer cases, and even then, after five years, only 26·4 per cent. of the cases operated on were alive. In considering the abdominal operation, with removal of diseased glands, he quotes Wertheim and Freund, who together showed that out of forty-four abdominal operations in only fifteen were enlarged carcinomatous glands found. On the other hand, infected lymph channels can be found in all cases of uterine cancer, and the operation which gives the best chance of removing these should give the best results. The adherents of the abdominal operation for cancer thought that the surrounding parametrium could be removed in no other way, but Schuchardt by his method was able to operate on 56 to 61 per cent. of cases presenting themselves for treatment, and obtained 40 per cent. of cures five years after the operations.

The essential character of Schuchardt's operation is a vaginal hysterectomy, aided by a lateral vaginal incision on each side, and a prolongation of one of them through the perineum, round the anus as far as the sacrum. The lateral incisions extend from the vaginal orifice to the lateral vaginal fornix. It will be seen that in this way the ischio-rectal fossa is laid open on each side, and the perineal incision allows the anterior vaginal wall to be much more widely separated from the posterior than is possible in the ordinary method of vaginal hysterectomy. This gives a better view of the operation field, and allows removal of the base of the broad ligament even as far as the side of the pelvis. Also it is possible by this method to see and separate the ureter before dividing the broad ligament or tying the vessels.

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The author describes thirty cases operated on by this method, with five deaths. Of these, two were really too serious for operation, and died some little time after the operation. Of the other three, one died of sepsis, the second of pulmonary embolism, and the third of peritonitis after perforation of the intestine. Six of the cases had extremely widespread infiltration of the parametrium, and in some, portions of bladder and ureter had to be removed. Two of the latter died, it is true, but they were the two above mentioned which were really too far advanced for any operation. Of the other twenty-five cases, many were complicated, and required a considerable width of tissue to be removed from around the cervix.

With his experience of these cases, the author regards the percentage of operable cases as doubled, comparing his present views with regard to operable cases with those he held formerly when performing the usual operation of vaginal hysterectomy. The author follows the steps of the operation practically as described by Schuchardt, but takes more care to stop all bleeding during its progress, instead of leaving this until the end. With regard to the bladder and ureter, he points out that it is easy to excise a portion of one or the other, and then the choice has to be made of implanting the ureter into the bladder, or leaving it to drain into the vagina. Naturally, the implantation of the ureter into the bladder through the vagina is a most difficult proceeding; probably most operators would prefer to complete the operation at a later stage by the abdominal method, or to remove the corresponding kidney. With regard to the healing after these operations, there seems to be little to choose between them and simple vaginal hysterectomies. The author gives photographs of six uteri removed by this method, showing very well the great width of parametrium he was able to excise. The greatest width was 120 millimetres, and there were nine other cases measuring over 90 millimetres across. The weak point in the author's argument is the fact that the cases were all operated on very recently, so that we have no chance of judging at present how many of them will remain without recurrence. If it can be proved that this operation gives not only a larger percentage of operable cases, but also a larger percentage of cures, then indeed it will be an addition to our knowledge in respect of cancer operations.

T. G. S.

A Further Contribution on the Radical Operation for Uterine Cancer (E. WERTHEIM: *Archiv für Gyn.*, 1901, vol. lxv.).—The writer previously published twenty-nine cases in which he had removed the cancerous uterus, as much parametric tissue as possible, and the neighbouring lymphatic glands, the abdominal route being chosen for the operation. In the present paper he gives the details of thirty-one further cases. Each record is accompanied by a

graphic indication (on an outline of the pelvis, uterus, ureters, and great vessels) of the seat and extent of the primary disease, together with the cellular tissue and glands removed. In most instances there is also a sketch of the preparation.

The writer next describes the stages of his operation with the aid of six photographs from the cadaver. After opening the abdomen by an incision from the pubes to the navel, the uterus is pulled up while the adnexa are drawn aside so as to expose the region of the ureters. These are seen through the peritoneum, which is then lifted with forceps, and split along the course of each ureter as far as the point where it enters the parametric tissue. This concludes stage 1. In stage 2 the uterus is drawn upwards whilst the bladder is separated from the cervix, the round, infundibulo-pelvic, and broad ligaments being then tied and divided. In stage 3, first on one side, then on the other, the finger is thrust along the ureter through parametric tissue until the bladder is reached. The uterine vessels are felt, tied, and divided. The ureters are thus exposed to sight along the whole of their course in the pelvis. In stage 4 the uterus is drawn towards the pubes. The peritoneum is divided across the pouch of Douglas, and the rectum is separated easily from the posterior vaginal wall. The utero-sacral ligaments are divided and bleeding-points are secured. In stage 5 the bladder is more completely freed from the vagina, so that the vaginal tube is at length free on all sides. Two right-angled forceps are now fastened across the vagina below the cancerous cervix. In stage 6 the vagina is cut through below the grip of the forceps, which are thus removed with the uterus, appendages and upper part of the vagina. In stage 7 all affected cellular tissue and lymphatic glands are cleared away in an orderly manner, first dissecting the outer side of the common and external iliac vessels, next the inner side of the common and internal iliac vessels, and lastly the triangle between the external iliac and the hypogastric vessels. The writer has never carried his dissection upwards above the bifurcation of the aorta. The raw surface is covered with peritoneum, and an iodoform-gauze drain is carried into the remainder of the vagina.

The writer next compares the results of his first series of thirty cases with those of his second series of thirty cases. In the first series there were twelve deaths; in the second, five. The causes of death in these five cases were: ileus without peritonitis, two; acute tuberculosis, one; shock, one (the patient was found to have secondary deposits in the liver at the autopsy); and pyelonephritis following necrosis of the walls of both ureters. The writer did not injure the ureters in any of the sixty cases, but in five of them formation of ureteral fistula occurred, owing to sloughing of portions of the walls of the ureters, ten to fifteen days after operation. The

lesion was always about 2 centimetres from the entrance of the ureter into the bladder. In one case there was spontaneous healing; in two cases the kidney was removed; in another pyelonephritis followed with fatal result; and in the fifth case one fistula has closed, the other remaining open. The writer holds that his immediate results justify the continued performance of the radical operation. The remote results, however, must be seen before the value of the procedure is assured. W. E. F.

The Simultaneous Occurrence of Glandular Cancer and Epithelioma in the Body of the Uterus (EMMANUEL: *Zeitsch. für Geburts. und Gynäk.*, Heft 3, 1901).—The author remarks that up to the present time only nine cases of epithelioma of the uterine body have been recorded, and this form of new growth must therefore be regarded as of rare occurrence in that organ. The view adopted by all authorities has been that the growth arises from a transformation of the single layer of cylindrical cells of the normal endometrium into a stratified layer of squamous cells which invade surrounding tissues, form epithelial pearls, and undergo horny degeneration, as in the case of an epithelioma growing from the skin. In no case, however, has the actual transformation of the epithelium from cylindrical to squamous type yet been demonstrated; on the other hand, no connection of the epithelioma with the uterine glands could be found, so that, although proof of the theory is not forthcoming, there are also no facts which point in a different direction to militate against it.

The author then relates the case of a woman, aged sixty-one, in whom, ten years after the menopause, hæmorrhage commenced and continued for eight weeks, before she came under observation on June 11, 1901. Emmanuel, after exploring the uterus, took a curetting for microscopic examination, and diagnosed a glandular cancer (adeno-carcinoma), with here and there large islets of stratified squamous epithelium. Steffick removed the uterus, and the patient made a good recovery. The uterus, examined after removal, showed no notable enlargement; on the middle of the posterior uterine wall was found a soft mass with a broad attachment to the musculature, the surface of which looked irregular and warty under a hand-lens. The cervical canal appeared to be normal.

The microscopic appearances are then set forth in great detail with the aid of a series of well-executed drawings; the principal points only need be noted here. The mucous membrane immediately outside the growth showed a single layer of well-preserved cylindrical epithelium; the glands, as would be expected in a woman of sixty-one, were somewhat shrunken, and here and there showed cystic dilatation. Of the tumour itself, parts showed the structure typical of adeno-carcinoma, other parts showed thick areas of stratified

epithelium which in places were arranged in concentric layers like a bulb, and frequently showed horny transformation; still other parts showed the gradual transformation of the adeno-carcinomatous type into that of the stratified epithelium. The marginal parts of the tumour showed typical adeno-carcinomatous structure; towards the centre this type was found only in the parts which had furthest invaded the musculature. The uterine surface of the middle part was covered with papillæ, each of which consisted of a thick layer of stratified epithelium in which a few epithelial pearls were found, and further, areas of stratified epithelium were found imbedded in masses of adeno-carcinomatous tissue.

A few metastases were found under the peritoneal coat of the uterus, *i.e.*, in uterine tissue at a distance from the primary growth, which consisted in like manner in parts of adeno-carcinoma and in parts of epitheliomatous tissue. The author lays stress upon the fact that neither in the primary growth nor in the metastases were isolated areas of stratified epithelium ever found; they were always in close association with the other type of tissue.

In discussing the interpretation of these appearances the author expresses his firm conviction that both types of cells have arisen from the cylindrical epithelium of the uterine glands, and certainly this conclusion appears to be a just one. He further observes that the transformation to stratified epithelium appears to start, not with the normal cylindrical cells of the mucosa, but with the proliferating cells produced under the stimulus of the malignant process, and forming the tubules of the adeno-carcinoma. To this change the term 'metaplasia' has been applied by previous authors. In conclusion, the author discusses the previously recorded cases, and finds support in them for his views. T. W. E.

KNAUER demonstrated a case of **Double Tubo-Ovarian Carcinoma** before the Obstetrical and Gynæcological Society in Vienna. (*Cent. für Gynäk.*, No. 43, 1901). The growths were removed by Chrobak. A year before the patient had a mammary tumour with enlarged axillary glands. The abdominal tumours may have been metastases, and the mammary growth the primary seat of the disease. Both pelvic growths were the size of a fœtal head. On the left side the growth on the tube made up the greater part of the tumour, that in the ovary being the size of a hen's egg. On the right side the bulk of the growth sprang from the ovary, and projected into the right broad ligament. This tube was enlarged in its middle part to the size of the thumb, and was much elongated and adherent. The tubal growths proved to be soft papillary carcinomata. The ovarian growths contained multiple cystic spaces, but its solid parts showed a papillary structure emitting a creamy juice on scraping. This growth was sharply outlined from the neighbouring ovarian tissue. The patho-

logical report was that the growth was a primary papillary carcinoma of the tubal mucous membrane, not, however, the pure papillary form of Sänger, but an adeno-carcinoma with papillary characters—Sänger's alveolar papillary carcinoma, analogous to the adeno-carcinoma of the corpus uteri.

Since in the tubal growths there was no germ or follicle epithelium, it is clear that these growths were primary, and that the ovarian growths were secondary. In the discussion Waldstein asked whether the pelvic growths were not metastases from the breast tumour, and cited a case where double-sided ovarian tumours were secondary to a pyloric cancer. Knauer said that the histological characters negatived the view that these growths were secondary to breast carcinoma, but added that the latter was not removed, and therefore not examined, and it was possible that the case was one of mammary cancer secondary to the pelvic growths, or that two independent growths of a malignant character were present in the same individual at the same time. C. L.

Intra-uterine Injections of Iodine in the Treatment of Endometritis and Inflammation of the Uterine Appendages (LEBOFF: *Vratsch*, Dec., 1901).—This paper details the results obtained in sixty cases of endometritis, oöphoritis, and salpingitis (chiefly of gonorrhœal origin), which were treated by the author with intra-uterine injections of iodine. He gives the history of several of his cases, and comes to the conclusion that the treatment is not only unsatisfactory on the whole, but that it is often injurious, and even dangerous, to the patients, and that it has a very unpromising future. Mironoff, in an article on the same subject in the *Charcoff Medical Journal*, takes the same view as Leboff. His opinion is based on a large number of cases which he himself treated with intra-uterine injections of iodine. His arguments are that: (1) the treatment is very disagreeable to both doctor and patient, chiefly because it is so painful; (2) the pain caused by the intra-uterine injections is sometimes so severe that the patients refuse to be treated after five or ten injections, and would rather submit to a radical operation; (3) the method has no distinct advantage over other modes of treatment which are much less painful, and by which equally good, if not better, results can be obtained; and (4) even after very prolonged treatment with iodine the patient is seldom cured, and relapses are common.

On the other hand, Lebedoff, who has been for several years assistant to Professor Grammaticati of the Tomsk Gynæcological Clinic, and whose experience is based on a great number of cases, appears an enthusiastic champion for the intra-uterine treatment with iodine injections. He tells us that the first to introduce this treatment in Russia was Professor Grammaticati. He started his

experiments in 1893 in his clinic on a series of cases of acute and subacute inflammation of the uterine appendages and of the pelvic peritoneum. He began the treatment very cautiously, and gave at first only two or three injections a week, but he found that better results could be obtained when daily injections were made. A few such injections produced amenorrhœa in most of the cases, which he thinks was caused by a temporary cessation of the process of ovulation, due to the action of the iodine. But it is also possible that the temporary amenorrhœa was due to the destruction of the superficial layers of the endometrium by the iodine. In a month or two after the cessation of the treatment the endometrium is restored, and menstruation becomes normal.

Lebedoff says that, though all cases of inflammation of the lining of the uterus and of the uterine appendages cannot be cured with intra-uterine injections of iodine, it cannot be denied that a great number are considerably benefited by it, and that the benefit is permanent. The best results are usually obtained in recent cases of inflammation, and the treatment ought to be commenced soon after the acute symptoms subside. Chronic cases cannot always be cured, but under the influence of the iodine injections the pelvic exudation gets partly absorbed, the inflammatory swelling subsides, the pain disappears, the purulent discharge from the uterus alters its character, becomes mucoid, and the patient feels much benefited. Nobody can doubt the antiseptic and antiphlogistic properties of iodine. Lebedoff says that the most frequent complication in his experience was pain in the lower part of the abdomen, which was mostly slight; sometimes it was more severe, and amounted to uterine colic. Severe pain mostly occurs in patients with a narrow cervix and an anteflexed uterus. In such cases he says the cervix ought to be well dilated with Hegar's dilators previous to the iodine injections, so that the injection needle should easily enter the cavity of the uterus. In some cases slight hæmorrhage occurred after the first few injections, and in two the hæmorrhage was rather severe. Plugging the vagina stopped the bleeding, and it did not occur again throughout the treatment. In some cases nausea, and even vomiting, occurred each time an intra-uterine injection was made. As to the *dangerous* complications, to which belong acute exacerbation of the inflammation of the appendages, para- and perimetritis, and general peritonitis, these complications used to be frequent in former times, but now they are very rare. Leboff, who generally condemns this mode of treatment, and whose experience is based on sixty cases, can only quote two in which serious complications arose and in both the patient got well.

In order to avoid serious complications, Lebedoff advises first of

all to be strictly antiseptic; further, to avoid too strong solutions of iodine, and not to inject with great force, so as to avoid all danger of the injected fluid being driven into the Fallopian tubes, and thence into the peritoneal cavity. There should also be no obstacle to the return of the injected fluid from the uterine cavity. If these precautions are taken, the dangerous element can almost be eliminated, and as on the whole a good deal can be said in favour of the treatment, Lebedoff recommends the Russian gynæcologists to give it a fair trial, and to use it more extensively in suitable cases.

H. G.-S.

On the Arterial Supply of the Ureter. — ANSELM FEITEL (*Zeitsch. für Geburts. und Gynäk.*, Bd. xlvi., Ht. 2) finds that the middle third of the ureter receives a special branch, which arises usually from the internal iliac, occasionally from the aorta, and less commonly from the common iliac artery; this branch is always present, and, arising from the inner or medial side of its parent vessel, runs along the inner side of the ureter. The lower third of the ureter receives its blood-supply from the uterine artery, the branch arising at or close to the place where the artery crosses the ureter, and always running along its outer side. Branches from the superior vesical were found eleven times in seven cases, but were seldom of notable size. Where it is necessary to lay bare the ureter in the course of an operation, Feitel concludes that the vessels should as far as possible be preserved by splitting the peritoneum on the outer side of the ureter as far as the middle of the pelvic portion, and below that point on the inner side. For the same reason the blunt separation of the ureter and of the vessels should as far as possible be avoided, and the glands are, where possible, to be carefully separated from the vessels that nourish the ureter. The author bases his conclusions on the examination of eight new-born female bodies, and gives nine illustrations of the varying conditions observed. T. W.

Three Cases of Ureteral Surgery.—HENRY C. COE, M.D., New York (*Amer. Jour. of the Med. Sciences*, Jan., 1902).—The author remarks that these cases illustrate the fact that in complicated cases, especially with intra-ligamentary tumours, it is at times impossible to identify the displaced ureters before they are injured, and that if they are injured nothing except the desperate condition of the patient should deter the surgeon from at once uniting the cut ends. He strongly deprecates suturing the end of the ureter in the abdominal wound or removing the healthy kidney. He also regards immediate repair as of the greatest importance, since secondary operations for the cure of ureteral fistulæ, even in the hands of experts, are beset with great difficulties.

Case 1.—A single woman, aged twenty-six, suffered from a rapidly

growing fibromyoma reaching as high as the umbilicus, and causing marked pressure symptoms. At the operation the tumour was found to extend into the broad ligament, and it displaced the uterine artery and ureter to such a degree that both were ligated and divided before the accident was discovered. The ureter was then freed from the ligature, the end surrounded with gauze, and the entire uterus removed. The ureter was next repaired by the lateral method of Van Hook and Kelly. Convalescence was normal; the average daily amount of urine 30 to 40 ounces to the sixth day, when a leakage was noted. This did not trouble the patient much, and although during her six weeks' stay in the hospital the fistula did not close, it subsequently did, and she regained perfect health.

Case 2.—A married woman, aged fifty-nine, was operated upon for double intra-ligamentary dermoid cysts and universal intestinal and intrapelvic adhesions. It was found necessary to remove the uterus, and the left ureter was torn across during the operation. The distal end of the ureter was so dilated that the proximal end was invaginated into it for an inch of its length, and the ends then secured with sero-serous sutures. The whole pelvis having been denuded of peritoneum, no peritoneal flap could be secured, so the entire pelvis was packed with gauze, on which the ureter rested. Whilst inserting the gauze traction was made on the ureter and the ends were pulled apart, so that the work had to be done again. Patient made an uninterrupted recovery, and passed a normal amount of urine from the outset.

Case 3.—A married woman, aged thirty-one, with a myxo-angeioma occupying the vesico-uterine pouch, displacing the uterus backward and the bladder forward. On trying to enucleate the tumour the bleeding became so profuse that Dr. Coe had to tampon the cavity and stop. Two weeks later he enucleated the growth, and found attached to the portion removed, a square inch of the trigone and one inch of the left ureter. He also found that the right ureter had been severed close to the bladder. Although the patient was very collapsed, Dr. Coe managed to suture the wounds in the bladder, and also united the left ureter to the bladder. The operation had then to be suspended, as the patient was apparently dying, and the right ureter could not be dealt with. The patient recovered from this operation, with a large fistula two inches in diameter in the base of the bladder, most of the sutures having given way. Three months later on examination it was found that the uterovesical anastomosis on the left side had been successful, and that the right ureter had become adherent to the edge of the fistula. This latter was suitably treated, the fistula closed, and the patient made a perfect recovery.

C. B.

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On the Passage of Carbonic Acid from Mother to Fœtus ... ... NICOLAY.
Eczema in Young Infants ... ... OUILLIER.
Results obtained by the Monthly Weighing of Young Infants ... BRESSET.

Annales de Gynécologie et d'Obstétrique.

Prophylactic Treatment of Ophthalmia or Conjunctivitis in New-born Infants PINARD.
Subchorionic Placental Cysts ... ... PITHA.
Cæsarean Section necessitated by Cicatricial Atresia of the Vagina LÉVÊQUE.

Comptes Rendus de la Société d'Obstétrique, de Gynécologie et de Pediatrie de Paris, December, 1901.

Laparotomy for Adherent Retroverted Gravid Uterus; Surgical Treatment of Adherent Retroverted Gravid Uterus ... ... DOLÉRIS.
A Fatal Case of Intestinal Obstruction appearing at the Commencement of Labour ... ... DE RIBES and DANIEL.

American Journal of Obstetrics, January, 1902.

Surgical Aspects of Carcinoma Uteri complicating Pregnancy, Labour, and the Puerperium ... ... CUMSTON.
Developmental Anomalies of the Uterus, with Reports of Cases ... WALKER.
Intestinal Anastomosis with Suturing of the Entire Thickness of the Intestinal Wall ... ... ALLIS.
A Case of Primary Carcinoma of the Urethra ... ... BROTHERS.
Elephantiasis of the Labium Majus ... ... LADINSKI.
Vaginal Hysterectomy with Four and a Half Months' Pregnancy... CARSTENS.
General Treatment in Gynæcological Patients ... ... CHASE.
Pelvic Fracture during Labour ... ... BIRD.

Edinburgh Medical Journal, February, 1902.

Diabetes and Pregnancy... ... ... HERMAN.

Lancet, February 8, 1902.

Ovarian Tumours and Ovariotomy during Pregnancy ... ... DORAN.
Two Cases of Solid Abdominal Tumour with Ascites ... ... EDEN.

REPORTS OF SOCIETIES.

OBSTETRICAL SOCIETY OF LONDON.

Annual Meeting, February 5, 1902,
DR. PETER HORROCKS, *President, in the Chair.*

Dermoid Cyst of the Ovary.—DR. AMAND ROUTH showed this specimen, removed *per vaginam* from a patient of fifty-three. He asked the Fellows to state their experience as to the best method of treating the vaginal incision after the pedicle had been ligatured and returned. He usually partly closed it and inserted a gauze drain, but sometimes closed it completely.

The PRESIDENT said that it might be questioned whether posterior colpotomy was as good as abdominal section for the removal of tumours in general and dermoids in particular. It was true that it might be an easy matter to remove a dermoid through the vaginal roof; but one could never tell beforehand, and if the abdomen had to be opened to complete the operation after the cyst had been opened from below, there would be increased risk of soiling the peritoneum with the dermoid contents; and it had struck him that the contents of a dermoid were occasionally more virulent than the contents of ordinary ovarian tumours. He preferred after a posterior colpotomy not to close the opening, but to drain with sterilized gauze. If the opening were very large it might be partially closed by a stitch, or better still by forceps.

Dr. F. H. CHAMPNEYS thought that the treatment of the vaginal wound should depend upon its size. If large, it should be partially closed, and a gauze drain put through the remainder; if small, no suture was necessary. He now treated the pedicles of cysts removed by colpotomy by pressure forceps and gauze drainage, without ligature, and found the result very satisfactory, the forceps (left on for thirty to forty-eight hours) assisting drainage.

Dr. G. E. HERMAN said the special danger attending the fouling of the peritoneum with the contents of dermoid cysts was due to the proneness of dermoids to suppuration, apart from which the contents were but slightly irritant. He thought that after removal of such a cyst *per vaginam* drainage was not needed, unless suppuration had occurred or the cyst contents were known to have fouled the peritoneum.

Abdominal Hysterectomy after Cæsarean Section.—Dr. AMAND ROUTH also showed a uterus with fibroids removed at eight and a half months of gestation. There were six fibroids, two of which were originally in the pelvis. One was pushed up, but the second one remained in the sacral hollow, preventing all chance of normal delivery. At the operation on January 31 last, the obstructing fibroid was found to be firmly adherent to the pelvic floor. Both mother and child remain well.

Dr. CHAMPNEYS said that the position of the fibroid behind the cervix would have rendered birth *per vias naturales* very difficult, even after destroying the child. He therefore thought Dr. Routh's treatment correct.

Two Cases of Tubal Gestation.—Mr. J. BLAND-SUTTON read notes on these cases. The first was that of a lady whose husband, a doctor, had diagnosed a tubal pregnancy, which Mr. Bland-Sutton, after confirming the diagnosis, removed before rupture. The gravid tube was larger than usual owing to the size of the contained blood mole, and to the unusual size of the amniotic cavity, which contained a misshapen embryo. In the second case the patient, aged thirty-six, had been confined in 1891, and was regular till July 5, 1901, when a period was missed, and she suspected extra-uterine pregnancy. Severe abdominal pain followed two cycle rides, and Mr. Bland-Sutton was called into consultation. He confirmed the diagnosis, and on July 19 removed the left tube and ovary and several ounces of fluid blood in the pelvis. The ampulla of the tube contained a clot as large as a walnut, the cœlomic ostium was large enough to admit a goose quill, and blood leaked freely from the opening during the operation. The walls of the tube were extremely thin, but had not ruptured. Typical villi were found at the placental site.

The PRESIDENT, with regard to the second specimen, called attention to the ease with which a tubal gestation might be ruptured during examination or during straining by the patient, and gave details of an unsuspected case which had proved fatal in this way.

Dr. HERMAN pointed out that the clot in Mr. Bland-Sutton's first specimen of tubal mole was in different degrees of decolorization, indicating hæmorrhage at different dates. Had the patient had successive attacks of pain? He had seen rapid increase of size in tubal moles between examination and operation.

In reply, Mr. BLAND-SUTTON emphasized the President's remarks, and said he always discountenanced dressers examining cases of suspected tubal gestation, for fear of rupture of the tube.

ANNUAL ADDRESS.

The PRESIDENT then delivered the annual address. He stated that (including fourteen honorary) there were 654 Fellows, and these included every obstetric physician and every teacher of obstetrics and gynæcology from the Medical Schools of London. The papers read and specimens shown during the past year had maintained the high standard of former years. Of seven papers read, six were obstetric and one gynæcological; but of the fifty specimens shown (excluding new instruments) thirty-four were gynæcological and only sixteen obstetric. The papers and specimens were then reviewed.

ALTERATION OF BY-LAWS.

Dr. JOHN GALTON proposed, and Dr. W. S. PLAYFAIR seconded, that the law which declares that 'registrable medical men' are eligible for election to the Fellowship, should be changed as suggested by the

Council, to 'registrable medical practitioners.' The proposal was carried unanimously.

A law was also passed by which Fellows, who might make communications to the Society, would be permitted to publish their papers in scientific journals after being read.

EDINBURGH OBSTETRICAL SOCIETY.

Wednesday, February 12, 1902, Dr. James Ritchie, *President, in the Chair.*

Symphysiotomy in Domestic and Hospital Practice.—Dr. P. C. Buist read a paper on this subject, which will appear in a future number of this Journal.

Remarks on Diagnostic Help in Gynæcology.—A paper upon this subject by Professor Fehling was read by Dr. Fordyce. The author referred to the fact that the success attending gynæcological operations had tended to depreciate the value of gynæcological diagnosis. While in many cases a definite diagnosis was not essential to a successful operation, there were others in which an accurate diagnosis might assist in the selection of the best operation or in modifying the steps of the procedure. He pointed out that an exploratory abdominal incision was not as free of danger as was often supposed. He proceeded to show that in many tumours of doubtful nature an exploratory puncture through the vaginal roof was of great value in determining the nature of the tumour and its contents, and there was scarcely any appreciable risk to the patient. Professor Fehling described the method which he had found most satisfactory, and gave a synopsis of the results in eighty-one cases in which vaginal puncture was employed. Finally, detailed notes of several cases of special interest were given.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

Section of Obstetrics.

January 7th 1902, Dr. W. J. Smyly *in the Chair.*

Laparotomy for an Ovarian Cystoma, which had ruptured Six Hours before Removal.—Dr. Alfred Smith, in describing this case, said ovarian cysts might spontaneously rupture into the peritoneal cavity or into some neighbouring organ. The effect on the patient depended on the character of the cyst and of its contents. Innocent ovarian tumours generally produced but trifling symptoms, some pain and profuse diuresis being the chief disturbances. His case showed what grave symptoms might follow spontaneous rupture of a multilocular glandular cystoma. He described the condition of the patient after operation, and dwelt on the points of special interest: (1) the cause of the spontaneous rupture; (2) the explanation of the toxic symptoms before operation; (3) the treatment of persistent vomiting after operation.

Dr. W. J. Smyly stated that he found rupture of ovarian cysts was sometimes caused by tapping, particularly if the operation had been repeated. Massage was also to be credited with causing the rupture of such tumours. He had seen the daily practice of massage diminish an ovarian cystoma to the vanishing point—the tumour had been ruptured and its contents rubbed out of the sac. Even gentle palpation had caused rupture. In the Adelaide Hospital, whilst very carefully palpating a tumour, it burst, and at once he performed laparotomy. He found a malignant cystic tumour, which he removed, and the patient recovered from the operation well, but some months after, the disease recurred.

A Case of Induction of Labour followed by Enucleation of Fibroid Tumour in the Cervix.—Dr. Kidd said that he had seen the patient when a little over four months pregnant, and thought it would be quite possible to deliver without operating if the tumour did not enlarge during further gestation, and if he was successful in inducing labour three months later. Patient returned at the appointed time. Labour was brought on by the introduction of a bougie between the membranes and the uterine wall. When the patient had been about thirty-four hours in labour the os was sufficiently dilated to enable two fingers to pass easily through it. The patient was then examined with the whole hand in the vagina under an anæsthetic, and it was found that the cervix could not possibly dilate sufficiently. Enucleation was resolved upon. This was done the same day under chloroform, and the cavity left by the tumour partly stitched, then packed with iodoform gauze. About seven hours after the operation uterine pains ceased, and did not return for ten days, the os in the meantime closing so that a finger could not pass. Owing to the packing being left off too soon the cavity filled with blood-clot, and must have become infected, as the discharge from it became distinctly fœtid. About twelve hours after her baby was born the patient had a severe rigor, and temperature went up to 106·4°; this came down gradually with appropriate treatment in two or three days, the lochia remaining free from any taint. She went home to the country within a month of the birth of the child. Dr. Kidd thought he was very fortunate to secure such a good result, but in future would advise an examination under an anæsthetic in the first instance, and would attempt the enucleation before resorting to the induction of labour. He referred to the statistics of many operators and observers, and concluded by quoting the improved statistics published by L. Thumin, and referred to under the heading of 'Current Literature' in the February number of the Journal of Obstetrics and Gynæcology of the British Empire.

Dr. Alfred Smith said that Dr. Kidd was to be congratulated on the successful issue of his interesting case. He thought Dr. Kidd would have had a better idea of what was to be done had he examined the patient under an anæsthetic. He was against inducing labour in such cases.

Dr. W. J. Smyly said that tumours of the cervix were very uncommon. He remembered Dr. Kidd's uncle saying that he had never seen one. When a tumour lay directly in front of the head he thought it should be removed. 'On and off' labours were not infrequent in cases of myoma.

Dr. KIDD, in reply, stated that last year he had a somewhat similar case in which he did not operate, and the woman went to full term and bore a healthy living child; she was warned that if she again became pregnant she should come into the hospital not later than the seventh or eighth month. When next heard of she had been in labour for seventy-two hours. He put on the forceps and delivered her; during the operation he found that the tumour had flattened out, and the child's head successfully passed it without injury.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Annual Meeting, Manchester, Friday, January 17, 1902,
Dr. S. BUCKLEY, *President, in the Chair.*

Two Specimens of Tubal Mole, by ARCHIBALD DONALD, M.D.—In each case, as far as could be ascertained, the pregnancy had been interrupted about the sixth week by the occurrence of hæmorrhage, which had destroyed the life of the ovum, but had not led to tubal rupture. In each tube there was a mass of blood-clot, in the midst of which an embryo was found, surrounded by amnion, but with no trace of liquor amnii. There was no blood or clot in the pouch of Douglas. The history of the cases varied. In one case there had been a period of amenorrhœa of nearly two months, while in the other there had been no absence of the ordinary menstrual period. In one case hæmorrhage followed upon the period of amenorrhœa, while in the other the hæmorrhage had started at what was thought to be a normal menstrual period. In each case the hæmorrhage was very profuse, and lasted for six weeks, and a well-defined tumour could be felt on one side of the uterus. In the first case the tube was removed through the abdomen, and in the second case by anterior vaginal section. Both patients made a good recovery.

Dr. GRIMSDALE referred to the fact that a considerable amount of bleeding into the tube could occur, as in Dr. Donald's cases, without rupture taking place, and thought that the latter accident probably occurred by a sudden hæmorrhage causing a rapid distension of the tube.

Dr. WALTER thought that amenorrhœa was not to be depended upon as a symptom of great importance, and that more reliance must be placed upon the physical signs.

Dr. LLOYD ROBERTS said that when there was a doubt as to the case being tubal or not, it was a question whether the abdominal or vaginal operation was preferable. In old-standing cases, with adhesions, there was considerable risk of opening the rectum when operating through the vagina.

Dr. E. T. DAVIS maintained that the diagnosis was conjectural in all cases. The difficulty of the vaginal operation was due to the fear of troublesome adhesions; but at the same time he thought that generally the cases operated on by the vaginal route recovered better.

Dr. DONALD, replying, said he thought the fact could not be too strongly impressed on their minds that tubal bleeding or rupture might occur before the symptom of amenorrhœa had time to appear. He was not much in favour of posterior colpotomy, except in cases of hæmatoma shut off from the peritoneal cavity. When the tubal tumour was movable and free he preferred anterior colpotomy, otherwise he operated by abdominal section.

A Series of Sections of Uterine Casts from Cases of Membranous Dysmenorrhœa.—Dr. FOTHERGILL showed sections of several casts of the uterus expelled by patients suffering from membranous dysmenorrhœa. These were all seen to consist of layers of fibrin concentrically arranged. Some of them contained enormous numbers of leucocytes, others very few. One of the casts had in one portion of its margin some small fragments of uterine mucosa, which was recognisable by the presence of uterine epithelium in glandular arrangement. The existence of fibrin casts was mentioned as if rare by most authors. The appearances of these specimens pointed towards an opposite conclusion, as they were all fibrinous exudates, one of which had a little uterine mucosa adhering to its margin. Dr. Fothergill had never seen a cast such as those described composed of mucosa and containing a lined cavity, and concluded that this must be a rarer form of membranous dysmenorrhœa than that illustrated by his specimens.

A Case of Recurrent Papilloma of the Vagina, by W. WALTER, M.D.—The patient was a single woman, aged thirty-seven. In 1898 she complained of bleeding between the periods. She was otherwise well. A red, somewhat papillomatous patch was found just within the vagina. It was removed by scraping and the thermocautery. The microscopical appearance was that of simple papilloma. There were several recurrences at intervals of a few months to a year. In December, 1901, the growth had again returned, and was about the size of a shilling. The disease was then freely excised. There was no evidence of disease in other parts. A careful microscopical examination showed that while the growth was of a papillary nature, there was evidence in some of the sections of epithelial invasion of the deep connective tissue and formation of cell nests.

REVIEWS OF RECENT BOOKS.

ÉTUDES ANATOMIQUES SUR LA GROSSESSE TUBAIRE. By A. Couvelaire, Chef de Clinique Obstétricale a la Faculté de Médecine de Paris. Twenty-one plates. Paris: Steinheil, 1901.

This is a highly important contribution to our knowledge of the anatomical changes occurring in the earlier months of the evolution of tubal gestation. The author bases his conclusions upon the methodical study by histological sections of fourteen tubal sacs containing a living ovum. Cases of hæmatosalpinx, more or less recent, and of retention of the dead fœtus are excluded, since these cannot be used for the investigation of the precise relations of the ovum and the tubal sac. In three cases Couvelaire was fortunate in obtaining uninjured tubal gestation sacs, one at the fourth week and two between the second and third months.

The first chapter is devoted to a classification of the varieties of tubal pregnancy during the first three months. The ordinary division into *interstitial*, *isthmic*, and *ampullary* gestation is adopted. No cases of *interstitial* pregnancy were observed. In seven out of thirty-five cases the ovum was engrafted in the *isthmic* portion of the Fallopian tube. The general characteristics of this type may be summarized as follows: early abdominal expansion of the tube, usually without any protective adhesions; early interruption of pregnancy, before the eighth week, followed by rupture and diffuse intraperitoneal hæmorrhage.

The *ampulla* of the tube is the most common seat of tubal gestation—twenty-eight cases out of thirty-five in the author's series. Apoplexy of the ovum took place in twenty cases. This did not, however, determine rupture of the tube, but a hæmatosalpinx was formed, with or without hæmatocele. In some cases the ovum continued to develop, and primary rupture of the tube occurred later. The *ostium abdominale* is frequently not occluded. In some cases it may present little modification, or the fringes may be more or less swollen and everted. Under these conditions the free pole of the ovum may project through the ostium, and the pregnancy may become *ampullo-infundibulo-abdominal* in position. The gestation sac in the early stages has a distinct pedicle, allowing of free mobility and prolapse into Douglas' pouch. In rare cases the pedicle may undergo torsion. The expansion of the ampullary fœtal sac may be towards the peritoneal cavity or into the broad ligament.

1. *Peritoneal Expansion.*—The sac may remain exclusively tubal, or, if the ostium be patent, it may become *secondary direct tubo-abdominal*. If, however, the tubal wall give way, the gestation may be described as *secondary indirect tubo-abdominal*. Cases are described illustrating these modes of development of the fœtal sac.

2. *Intra-ligamentous Expansion.*—In these cases the placenta develops in the region of the meso-salpinx. If the ovum is situated in the external

part of the tube, the expansion is only partially intra-ligamentous, the sac becoming adherent to neighbouring organs. Complete intra-ligamentous expansion of the sac is exceptional, and no case was observed by the author.

The changes occurring in the Fallopian tube as the result of gestation were carefully studied in numerous specimens. At some distance from the ovum little alteration is seen beyond increased vascularity and slight swelling of the mucosa. There is no loss of epithelium. The portion of the tube around the fœtal sac shows great hypertrophy of its muscular and connective tissue coverings. The mucous membrane is much swollen from cellular hyperplasia. The folds of the mucosa are thickened, and contain groups of large pale polyhedral cells, the so-called 'decidual cells' of the tube. The epithelium remains intact in the early weeks. No evidence of any 'gravid reaction' was found in the tube of the opposite side, such as that described by Webster. (Two cases only were investigated on this point.)

In three cases the topographical anatomy of the ovum in an unruptured sac was studied by serial sections. The conclusions arrived at are, stated briefly, as follows:

1. The chorion of the early tubal ovum is villous in its whole extent.

2. The ovum is attached by one pole to the tubal wall (the area of parietal insertion), whilst the opposite pole lies free in the tubal cavity.

3. At a later stage (two to three months) the villi have partially disappeared, and the discoidal placenta is localized over the zone of parietal attachment. The non-villous area corresponds to the free pole of the ovum, which up to the end of the third month has not contracted any adhesions to the tubal wall.

The relations of the gestation sac to the Fallopian tube are considered in Chapter IV. By the end of the fourth week the tubal epithelium over the area of parietal insertion of the ovum has disappeared, but no structure comparable to the spongy layer of the uterine decidua can be distinguished in the tube. The inter-villous space of the embryo is separated from the muscular and vascular wall of the tube by a layer of unequal thickness, composed of cellular elements arranged in a more or less dense fibrinous stroma. This is the 'external capsule of the ovum.' The cellular elements are of three types: (1) polygonal clear cells with large oval nuclei; (2) large granular cells with multiple nuclei; (3) plasmodial masses of irregular shape with several nuclei (syncytium). This layer has been considered by many observers as equivalent to the 'decidua serotina' and to be of maternal origin. Couvelaire, however, brings strong evidence to show that it is constituted entirely of fœtal elements. There is no space between the capsule and the wall of the fœtal sac. The tubal wall immediately beneath this external capsule of the ovum shows intense leucocytic infiltration.

During the early months the free pole of the ovum is covered by a limiting membrane composed of an alveolar stroma of dense fibrin and numerous polyhedral cells, with large nuclei similar to those found on the

external capsule. In the early period chorionic villi are embedded in this, but they soon undergo atrophic changes. This free pole of the ovum is in contact with the thickened folds of the tubal mucosa, more or less infiltrated with leucocytes. The tubal epithelium is present at first, but later it degenerates.

It is thus clear that the author regards the whole of the external covering of the tubal ovum as *fœtal* in origin. It can, therefore, only topographically be considered as fulfilling the functions of a decidua serotina and reflexa. No true decidua is formed in the tube in any way comparable to the decidua of normal pregnancy.

The mechanism of tubal rupture is shortly discussed. At some period during the evolution of the gestation, apoplexy of the ovum almost invariably occurs. In isthmic pregnancy this leads to immediate rupture, whilst in ampullary pregnancy it often terminates in hæmato-salpinx or hæmatocele. Apoplexy occurring at the 'free pole' of the ovum causes intra-tubal hæmorrhage, and if the ostium is patent hæmatocele is produced. The zone of the parietal attachment of the ovum is, however, the 'seat of election' for rupture of the tube. Over this region the wall of the tube is of very unequal thickness, and is still further weakened by numerous interstitial apoplexies situated between the capsule of the ovum and the tube, and also in the thickness of the wall itself.

The series of cases—fifteen in number—which form the basis of Couvelaire's conclusions, are recorded in full detail, with very complete reports on the pathological anatomy and microscopic appearances of the specimens. The illustrations, which consist of twenty-one plates with numerous figures, are of a very high standard of excellence, and demonstrate very clearly the views put forward by the author.

This work is the result of much careful observation, and is well worthy of study by all those interested in the subject.

Beiträge zur pathologischen Anatomie der graviden Tube. Von Dr. med. August Petersen, Copenhagen. Berlin: 1902. S. Karger.

This is the abridged German version of a paper published in 1900 in Danish, and contains the results of the investigation of fourteen cases occurring in the Copenhagen Maternity Institute, which is under Leopold Meyer's direction. From the care with which the material has been worked these observations are of considerable interest and of distinct value. Transverse sections of the complete tube were taken at intervals of 0·5 to 1·0 centimetre over its whole extent, and included the whole of the periphery at each point. In nine cases the second tube was also removed and examined. The investigation deals first with the relation of salpingitis to the etiology of tubal pregnancy. Twelve of the cases showed inflammatory changes which regularly decreased from the uterine end outwards, in both gravid and non-gravid tubes, and at the points of attachment of the ova were almost or entirely absent. From their chronic characters it was judged that they were of prior date to the pregnancy. The parts in contact with the ovum showed only the effects of pressure.

Bacteriological examination was possible in four cases. The results were mostly negative, and the author does not strengthen his paper by the hypothetical invocation of gonorrhœa. In two cases no salpingitis was found, and in these the author suggests there was imperfect peristalsis, caused in the one by twisting of the tube, and in the other by fatty degeneration of the muscular wall. Upon the question as to whether the ovum can be implanted on an abnormal mucous membrane, the material does not give definite evidence, but in one case decidual formation was found in both tubes, not only in normal but in catarrhal mucosa.

The second part of the paper deals with anatomical questions relating to the implantation of the ovum. Seven of the eight cases which were suitable for the purpose showed distinct evidence of the existence of a capsular membrane. The other had reached the fourth month. None showed epithelium on the side next the ovum, and at the base strands of muscle fibre passed from the tube wall into the capsule. The mole lay directly on the muscle layers. In the ampulla the loose connective tissue allowed a better development of the capsule. At the point of attachment, the tube wall was usually thinned. In one case with implantation on a fimbria, the adjoining tissue was hypertrophied. Distinct decidual cells were found at the point of implantation in only one case, at the end of the third month; in three they were found in the capsular membrane. Only two cases showed decidual cells in a part of the mucous membrane not surrounding the ovum. One case in the fourth month showed decidual formation in the non-gravid tube. A decidual-like transformation of the cells from the Langhans' layer was relatively common. The results of the investigation thus harmonize and extend the conclusions of other recent work. They are well arranged and clearly stated, but in several instances the author has given in the first place the conclusion of some other writer, and has assumed the appearance of seeking for arguments in its support rather than independently interpreting his own cases.